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2961

THE PILLARS OF BEN.

By Daniel G. Brinton, M. D.,

Professor of American Archæology and Linguistics in the University of Pennsylvania.

The pillars of Ben are some curious monolithic monuments dating from remote antiquity, found in the State of Chiápas, Mexico. They have never been figured or fully described, nor is the purpose of their construction definitely understood. I shall begin what I have to say about them by quoting some references to them from local writers.

Nuñez de la Vega, who was bishop of Chiápas about 1690, in describing the time-count of the Tzentals, a Mayan tribe, and the most numerous in his diocese, says: "*Been* is the thirteenth hero of their calendar, and it is said that he left his name inscribed on a stone erected in the vicinity of the town of Comitan."[1]

A later writer, Emetorio Pineda, who composed a geographical description of the department of Chiápas about half a century ago, gives more extended information, as follows:

"*Been* traveled throughout the department, and left monuments of his journey at various points that he visited. The most noteworthy one, which still remains, is an upright stone in the shape of a tongue or lance-head, two and a half or three yards (*varas*) wide and two-thirds of a yard thick, on which he inscribed his name. There is another about six leagues west of the town of Comitan, near a place called Quixté, but which lacks the inscription. The natives pay it adoration, baring their heads and kneeling before it. They adorn it with garlands of leaves and fragrant flowers, so that at its base there is quite a pile of decaying vegetation from this source. These dry leaves they collect, and with them rub their breasts and carry them away as relics.

---

[1] *Constituciones Diocésanas del Obispado de Chiápas*, p. 10 (Rome, 1701).

"There are other stones of this same character on the haciendas of Rosario and Buenavista, in the Valley of Xiquipulas, in the midst of abundant ancient ruins; but these do not appear to be worshiped. Another is found in the deserted village of San Juan Tiltepeque, in the district of Tonalá, and it still serves as the line-stone between neighboring properties."[1]

The last clause refers to the ancient tradition of the Tzentals, that their ancestors were conducted into the region of Chiápas by their hero-god Votan. He divided the land and assigned it to their several clans, and it was Ben (or Been) who went about erecting these pillars to mark the boundaries of each.

This seems also referred to in the name "Tliltepec," from the Nahuatl, *tliltia*, to stop, to halt, and *tepec*, mountain or village—that is, the stopping-place or limit.[2] It is a short distance northeast from the modern village of Tonalá, and is still the site of important ruins. When Dr. C. H. Berendt visited it—and, so far as I know, no other antiquary has explored that region—he found a platform mound supporting five large altar-stones ornamented with representations of men, fruits, etc., carved in relief, various stone rings, circular upright monoliths, etc., but nothing which could be definitely identified as the legendary pillar of Ben.

He was more fortunate in searching near Comitan. He there found one of the pillars referred to, and made the sketch of it which I insert (Fig. 1). It is pointed at the top, roughly circular, and

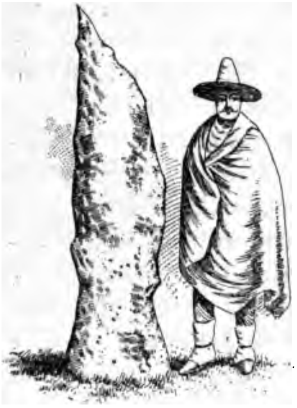
Fig. 1.

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[1] *Descripcion Geografica de Chiápas*, pp. 7, 8 (Mexico, 1845). The Valley of Xiquipulas, or Jiquipulas, is in the district (partido) of Tonalá, and is thirty-two leagues southeast of San Cristobal. At the discovery, it appears to have been occupied by some of the Pipiles, who spoke a dialect of the Nahuatl.

[2] Rovirosa, in his *Nombres Geograficos de Tabasco y Chiápas*, derives Tliltepec from Nah., *tlilli*, black. This is a possible derivation, but has no special application.

without inscription. It is probably, therefore, the one referred to by Pineda as near Quixté. In height it is about ten feet above the soil (the artist, in copying Berendt's sketch, has made the man too tall). Dr. Berendt adds that at the time of his visit the stone was still an object of veneration by the natives, as it was when Pineda wrote.[1]

The Abbé Brasseur de Bourbourg asserts that this pillar "resembles the monolithic pillars of Copan and Quiriguá;" but as he acknowledges that he never saw it, his opinion does not carry weight.[2] It is probable that these pillars were of quite a different character from the carved monoliths to which he refers.

To reach a more definite conclusion on this subject than can be obtained from the sparse Tzental legends, let us inquire what was known of Ben in adjacent tribes.

In the calendar of the Mayas of Yucatan, the thirteenth day of the ritual month also bore the name Ben, and its signification has occupied the attention of scholars. Pio Perez, in his discussion of the meaning of the Maya day-names, asserted that *ben* was a word which did not belong to the Mayan stock, but to the "Chiapanec,"[3] though it is not clear what he meant by the latter term.

There is, however, a verb in both Maya and Tzental, *benel*, to go, the past participle of which has the sense "used up," "gone," as in the English phrase, "I feel utterly gone." This is the meaning Dr. E. Seler attributes to the day-name *ben*, though with what relevancy is not clear.[4]

I have elsewhere called attention to the fact that the day Ben of the Tzental calendar corresponds with the day *Acatl* of the Aztec calendar, which word means "reed;" and as in Tzental the term *cagh-ben* is applied to a dried reed or cornstalk, it is possible that there is here a reference to the signification "reed."[1]

---

[1] My quotations from Dr. Berendt, and also the drawing, are from his unpublished MSS. in my possession.

[2] *Histoire des Nations Civilisées du Mexique*, T. I., p. 96.

[3] Perez's article was reprinted by the Abbé Brasseur in his edition of Landa. See page 373. The Maya always has the form *ben;* in Tzental the vowel is lengthened—*bēn* or *been.*

[4] *Zeitschrift für Ethnologie*, 1888, p. 77.

There are, however, other derivations which should be considered.

The word which, in the widest signification, means "man," *homo*, is almost the same in the three adjacent linguistic stocks, the Mayan, the Zapotec, and the Zoque. It is none other than this word *ben*, as is seen in this grouping:

Zapotec, *beni* (*beni niguio*, man; *beni guna*, woman; *bini*, boy).

Zoque, *ben-ne*, and *puen*.[2]

Mayan, *uinic*, *vinik*.

Here the Zoque, which is geographically intermediate between the Zapotecan and the Mayan stock, exhibits also the intermediate form of the radical—*ben*, *puen*, *vin*, or *vuin*.

As all, or nearly all, radicals in Maya are monosyllabic, the word *vinik* has been generally considered to be a composite theme, its two elements *vin* (*win*, *bin*) and *ik*, which latter is the word for wind, breath, or life. It is well known that in the older dialect the sounds *ben*, *been*, and *bĭn* were interchangeable,[3] so that it looks as if the identical radical was at the base of those three contiguous forms.

According to rather doubtful authorities, the Nahuas of Mexico had some reminiscences of the hero Ben. The historian Gay quotes an ancient hieroglyphic MS. once in the possession of Señor Herrera Perez, of the city of Mexico, which had been translated as recording that Ben was the son of Tanub, who was the youngest of the seven personages who conducted the celebrated migration from Chicomoztoc, "the Seven Caves."[4]

This Tanub journeyed to the far south. He is often mentioned as Tamub in the *Popol Vuh*, the sacred book of the Quiches of Guatemala, and its translator, the Abbé Brasseur, asserts that the clan named after him was conceived to have been the first to reach that territory.[1]

---

[1] *Native Calendar of Mexico and Central America*, p. 29.

[2] Coruna y Colludo, in *Trans. St. Louis Acad. of Sciences*, Vol. IV, p. 37. The number of Zoques in the State of Chiápas still speaking their own tongue is about 25,000. See José M. M. Sanchez's *Gramatica de la Lengua Zoque*, p. 56.

[3] See Pio Perez's *Diccionario de la Lengua Maya*, p. 23.

[4] José F. Gay, *Historia de Oaxaca*, p. 53.

It is scarcely necessary to add that such names as Tanub (Dan) and Ben have served to support the favorite theory of some that the "ten lost tribes" reached Central America; and we find the erudite Dr. Cabrera mentioning that the curate of Yatahuacan had in his possession "a little historical book of an Hebrew Indian nation, which may probably be that of Ben."[2]

In the quotation from Nuñez de la Vega, with which I began this article, that author tells us that Ben left his name inscribed on the pillar of stone. It would be interesting to have a copy of this inscription. But we may assume that it is the character in the calendar which corresponds to the day which leaves his name.

This is well known, and offers but few and unimportant variations in the Codices. The typical form is *a*, Fig 2;[3] *b* is that given on the monuments; *c* is from the Codex Troano; and *d* from the late and corrupt Books of Chilan Balam.

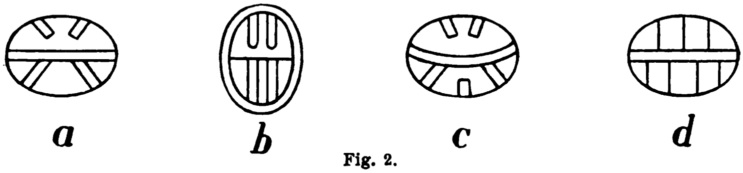

Fig. 2.

What object this figure was intended to represent remains uncertain. Dr. Seler, with his usual positiveness, insists that there is "no doubt" but that it depicts a straw or rush mat;[4] but the well-known conventional picture of a mat, common in all the Codices, is, to my eyes, fundamentally different.

I have elsewhere suggested that the central transverse lines indicate a foot-bridge or passarelle, on supports, a structure called in Maya *be che*, and that it is an imperfect rebus of the name *be-en.*[1]

---

[1] Abbé Brasseur, *Le Popol Vuh*, Introd. p. cclix, and p. 207. Tamub is mentioned as chief of the second "nation" of the Quiches in the *Titulo de los Señores de Totonicapan*, p. 12 (Edition of Charencey, 1885).

[2] *Teatro Critico Americano*, p. 108.

[3] Landa, *Relacion de Yucatan*, p. 204.

[4] *Zeitschrift für Ethnologie*, 1888; pp. 77–80.

Although this is a possible explanation, there is another which has much in its favor, and that is, that the design represents the ridge-pole and rafters of a native house. Mr. Henry C. Mercer informs me that such a house is constructed by lashing the rafters to the ridge-pole and covering with grass or mats.

This explanation is strengthened by the similar designs on the Iroquois' wampum belts, oblique lines conventionally representing the *kanasta*, or rafters of the *kanasta tsikowa*, the "great frame-work," or "long-house," and symbolically the great league of the Iroquois confederacy.[2]

We should thus find in the design for Ben the symbolic representation of the tribal unity, with which the myths concerning his supposed personality connect him, assigning to him the separation and delimitation of the various clans or gentes.

The single sign *ben* in the Mayan Codices is frequently combined with others. I shall mention only one of such combinations, partly because it is the most frequent of all, partly because it bears upon a derivation of the name referred to above. This is the combination of the *ben* with the *ik* sign, as follows:

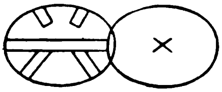

Fig. 3.

The word *ik* means wind, and the sign within the circle is supposed to indicate the four winds or wind-quarters. The composite sign itself has been regarded by Dr. Seler as the ideogram for war.

Is it not the ikonomath or rebus for *vin-ik*, meaning man in general, or some allied sense of that word?

Other detached monoliths have been reported from Mayan territory, and the suggestion has been advanced by Stephens as well as later writers that they were phallic symbols. Such seems without doubt to have been the case with various examples discovered by Theobert Maler and depicted in recent numbers of the *Globus*, where the form of the stones clearly indicated what they represented.[1]

---

[1] *Primer of Mayan Hieroglyphics*, p. 113. The word *zbelel* in the Tzental means road, street, or path.

[2] See Horatio Hale, in *Journal of the Anthropological Institute*, Vol. XXVI, p. 244.

But we learn from Bishop Landa's work that the Mayas were also accustomed to erect pillars called *uah tun*, "stones set up," at their annual festivals to the Bacabs, or four mythical giants who were supposed to stand, one at each of the cardinal points, and uphold the sky.[2]

These Bacabs were in many respects identical with the four "year-bearers," Dominical days by which the calendar and its cycles were reckoned.

Among the Mayas of Yucatan, Ben was not one of these "year-bearers," or capital days; but in the indiction of the Tzentals, Ben was the third of such days, the sequence being Votan, Lambat, Ben, Chinax,[3] while in the Maya it runs Kan, Muluc, Ix, and Cauac. In neither of these calendars does the ritual year begin with a Dominical day, and for this reason Ben is counted as the thirteenth instead of the eleventh day, as it would otherwise fall.

That each of these day-names was applied to some hero-god or mythical being, we know not only from Nuñez de la Vega, but from the earliest authority we have on Mayan mythology, Father Francisco Fernandez, whose account has been preserved to us in the writings of Bartolomé de las Casas, the celebrated "Apostle of the Indians," who was bishop of Chiápas in 1547.[4]

I am inclined, therefore, to believe that these pillars were originally erected to Ben in his *rôle* as one of the year-bearers, identified with one of the Bacabs, and thus with one of the cardinal points, and the wind which blew from it. This, of course, carried with it a whole train of symbolism, such as we find detailed in Mexican and Mayan mythology, but about which, in the Tzental land, we have but very meagre notices. It is to be hoped that further researches will be undertaken in the State of Chiápas, so rich in relics of the ancient inhabitants, which will aid in clearing up this, and other, interesting questions in its archæology.

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[1] See *Globus*, October, 1875; also *Verhandlungen der Berliner Anthrop. Gesell.* 1895, s. 678; 1896, s. 467. Other examples in my *Nagualism*, pp. 49, 50.

[2] *Relacion de las Cosas de Yucatan*, pp. 207–9. There may possibly be an *equivoque* in the Maya expression. The word *tun* means a stone, but *ton*—"miembro genital del hombre adulto."

[3] See the comparative lists in my *Native Calendar of Mexico and Central America*, p. 12.

[4] Las Casas, *Historia de las Indias*, cap. 123. See, also, Remesal, *Historia de la Provincia de Chiápas*, Lib. V, cap. VII. The early legend describes these hero-gods as "clothed in flowing robes, with sandals on their feet, long beards, and bare headed." The long chin beard is often represented in the Mayan statues and reliefs, and is likewise mentioned in Aztecan myths. Full beards, though unusual, are not unknown in pure-blooded American tribes.

THE SO-CALLED "BOW-PULLER" IDENTIFIED AS THE GREEK *μύρμηξ*.

By Daniel G. Brinton, M. D.,

Professor of American Archæology and Linguistics.

In the *Essex Institute Bulletin*, Vol. XXVI, p. 141–166, Professor Edward S. Morse has a carefully prepared and abundantly illustrated article on "The So-called Bow-pullers of Antiquity," in which he discusses the use to which was put a curiously-shaped object occasionally found in Greek, Roman, and Etruscan tombs. It is usually labelled in museums of classical archæology a "bow-puller" or "bow-stretcher," *Bogenspanner*, *Tira archi*, etc. But as the conformation of various specimens renders this use for them impossible, a number of other applications have been suggested, as that it is a caltrop or tribulus, a spear-thrower, a snaffle or curb, a bit for a horse, and even a screw-driver and a lamp-wick holder! These and other suggestions are carefully considered by Professor Morse, who gives conclusive reasons for rejecting them all, but adds none of his own, saying (p. 142) that after "a study of it for over seven years I reluctantly yield the solving of the enigma to others, having got no nearer an explanation of it than when I first began."

Professor Morse's article and illustrations were copied, more or less fully, in various European journals (*Globus*, Bd. LXXI, No. 10, *Nature*, etc.), but no explanation was offered of this mysterious object.

There is in the Museum of the University of Pennsylvania a beautiful specimen of this so-called "bow-puller," obtained by the late Mr. F. C. Macaulay from near Orvieto. A study of Professor Morse's pamphlet and of this specimen led me to a conclusion as to the use of this class of objects which I believe is incontrovertible.

They are examples of the μύρμηχες of the Greeks, part of the offensive armor of the pugilist, which he chained or strapped to the leathern cæstus enfolding his hand, and which enabled him to deal a terrible and often fatal blow to his adversary.

This identification answers all the conditions of the problem as presented in Professor Morse's article. The implement is usually of bronze, in the form of two rings springing from a solid centre or body, from which rise some projections or points at right angles to the plane of the rings. Generally the external portions of the rings turn slightly upward. The purpose of this was that they could be lashed the more firmly on the cæstus. The projections are from three to five in number, and are sometimes long and sharp, in others mere knobs.

The decoration, such as cross-hatchings, ribs, phallic designs, etc., was always on one side, to wit, that turned toward the dorsal surface of the hand on which the implement was strapped, that side being the one visible to the observer.

The average length from one end of the rings to the other is about seven centimeters, of which the body, or central portion, where the projections are situated, occupies about two centimeters. This is the size which would adapt it to the average hand or clenched fist, covered with the cæstus.

The signs of wear show that the chain or strap by which it was fastened passed through one of the rings, from above downward, under the central piece or body, and from below upward, through the other ring. This indicates the manner in which it was attached to the cæstus.

The breakage or bending of the spines in some specimens, or of the rings themselves, is easily explained by the violence to which they would be subjected in pugilistic encounters.[1]

The beautiful specimen referred to, now in the Museum of the University of Pennsylvania, is shown in the subjoined engraving. It is of bronze, delicately chased and ornamented with phallic devices in relief on the side corresponding to the dorsal surface of the hand. These devices either symbolized vitality and strength, or were simply meant as charms for good luck, as they are still regarded in southern Italy. The three points rise about 1½ inches above the body, and would thus constitute a most formidable weapon.

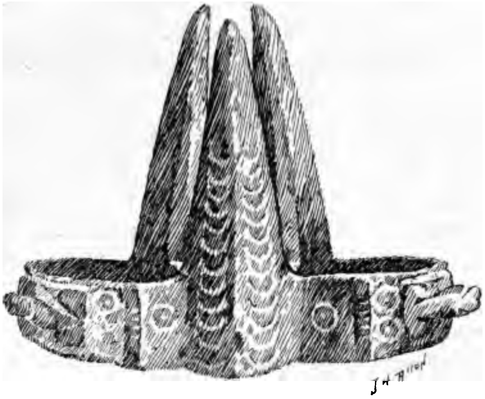

Fig. 4. Bronze Myrmex.
Museum of Science and Art.

Fig. 4 shows the decorated aspect as the implement rests on its base, and Fig. 5 the base with the two apertures through which the strap or chain was passed which lashed it to the cæstus.

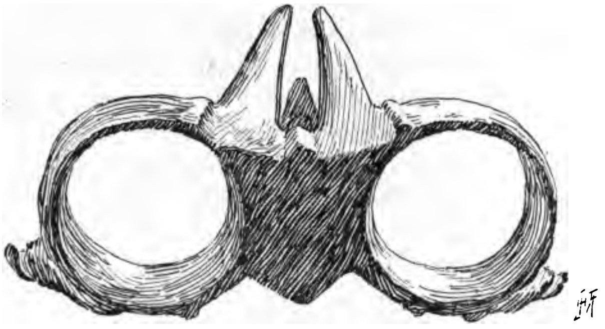

Fig. 5.

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[1] I announced briefly this identification in *Science*, April 16th, 1897, p. 614.

By fastening this specimen over a handkerchief wrapped around the proximal phalanges of the fingers, I demonstrated its use entirely satisfactorily to Director Mr. Stewart Culin and the Curator of the department, Mrs. Cornelius Stevenson, as well as to others who had read Professor Morse's description. This explanation answers every peculiarity of the instrument.

The adaptation of the implement to the purpose I have mentioned having been thus demonstrated, it remains for me to collect some material from classical writers, showing the use of the *μύρμηξ* and its form.

Pugilism (*πύγμη*) in classic times was both an ancient and an honorable art. Apollo himself conquered Ares in a fist fight, and the invention of the science of boxing was attributed to Theseus.[1] The Etruscans took especial pleasure in such contests, and they are often represented in the mural paintings of their tombs.[2]

Not only was it a game, a test of strength and skill, but it was a branch of the art of war, and for this reason Plutarch places it first in the ranks of gymnastic exercises,[3] reminding us of the line of Lucretius:

> Arma antiqua manus, ungues dentesque fuerunt.[4]

The cæstus[5] (Greek, *ἱμας*) was originally a strip of rawhide forming a bandage along the forearm and wrapped a number of times around the proximal phalanges of the fingers. It served both to protect the fist and to deal a heavier blow. To render it still more formidable, pieces of iron or lead were sewed on to the outer folds, thus adding to the force of the impact. This is familiar from both Greek and Latin poets; as when Homer describes the match between two champions:

> "Amid the circle now each champion stands,
> And poises high in air his iron hands.
> With clashing gauntlets now they firmly close," etc.
> *Iliad*, Bk. XXIII, 684, sq.

---

[1] Krause, *Gymastik und Agonistik der Hellenen*, s. 498. I am indebted to this learned work for many of the references in this article.

[2] K. O. Müller, *Die Etrusker*, Bd. II, s. 220. Second edition.

[3] *Symposia*, Bk. II, Q. 4.

[4] *De Rerum Nat.* Bk. V, 1282.

[5] *Cæstus*, from *cædo*, not related to the Greek *κεστος*, nor was the latter word applied to the object in question.

So Virgil, in a familiar passage:

> "—ingentia septem
> Terga boum plumbo insuto, ferroque rigebant."
> *Æneid*, Bk. V, 405.

The assertion in Smith's *Dictionary of Classical Antiquities* that such loaded thongs were used only in later times is contradicted by the quotation from Homer and by other early authorities.

The most formidable of all attachments to the cæstus was the *μύρμηξ*. It received its name from the projections, points, or spines with which it was armed (*μύρμηκια*, a prominence, a wart, etc.)[1] These were really weapons, and were so regarded, *μύρμηκες δε τα οπλα*, says Hæschyius. They were called *γυιοτοροι*, "limb-piercers," and Krause is undoubtedly right when he speaks of them as, "the most terrible of weapons adapted to the fist."[2]

Nor were they the invention of a later time. Professor Morse says (p. 148), "They belong to pre-classic and early classic times;" and in this he only confirms what Krause remarks: "The invention of this weapon belongs undoubtedly to an early period.".[3]

That the use of it in the games of the arena continued to a late period we have the testimony of several writers. In one of the epigrams of Lucillius, an Italian Greek of the first century, we have two lines describing the effect of the sharp points of the myrmex on the defeated combatant:

> *Κόσκινον ή κεφαλή σου, Απολλοφανες, γεγενηται*
> *Οντως μυρμηχων τρυπηματα λοξα και ορθα* :

> "Your head! O Apollophanes, has become a sieve,
> From the straight and oblique holes made by the myrmekes.

---

[1] Though others derived it from *μύρμηξ*, an ant, "quoniam artus perforant ac mordicant formicarum modo" (*Stephanus*, *Thesuurus Græcæ Linguae*, s. v.). The comparison and the derivation are equally absurd.

[2] "Die schrecklichste aller Faustrüstungen mochte in den *μύρμηχες* bestehen." u. s, p. 506.

[3] "Die Erfindung dieser Bewaffnung gehört zuverlässig einer frühen Zeiten." Ibid. s. 502.

This ghastly joke proves that the myrmex was furnished with projecting spines, which perforated the adversary's flesh.

Another and later Greek poet, Christodorus, of about 500 A. D., has left a poem describing the gymnasium at Byzantium and some of the contests exhibited in it. One of his pugilistic champions is referred to thus:

> *γυιοτορους μύρμηχας ἐμαίνετο χερσιν ἑλίσσων*;
>
> " He grew furious, whirling in his hand the limb-piercing myrmekes."

Prof. W. H. Appleton, of Swarthmore College, to whom I am indebted for this quotation, points out that Liddell and Scott consider that in this passage the cæstus entire is intended; but he believes the context gives my interpretation the preference.

It is evident that the term *γυιοτορος*, " limb-*piercing*," could not be applied to the blunt *σφαιραι*, or masses of lead and iron, sewed (*insuti*) to the cæstus, but only to an implement with sharp points, of the character and shape of the so-called " bow-puller."

In these days, when the redoubtable champions of the fistic arena are required to wear soft gloves in their most decisive encounters, it shocks us to contemplate such a dreadful accessory to these always bloody and brutal contests. But the spectators in the Circus Maximus had no such squeamishness. Brutality and blood were what they demanded, and no device of either could shock their palled senses.

Another use, less painful to our thoughts, has occurred to me for these lethal implements, and though I have not found conclusive authority for it in classic writers or classic art, it is worth mentioning.

In the ceremonial sacrifices, the animal, which may have been a sheep or goat, or, in the early times, a slave or captive, was usually killed at the altar by being knocked down; and if the blow did not at once kill or at least stun it, the sacrifice was deemed inauspicious.[1] May not a main purpose of the myrmex have been, so to arm the fist on such occasions that its blow would be surely fatal?

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[1] Harwood, *Grecian Antiquities*, pp. 157–8.

COLLECTIONS AND PUBLICATIONS.

AMERICA.

UNITED STATES.

Delaware Valley.—Mr. Henry C. Mercer, the Curator of the Section of American and Prehistoric Archæology, has just published in Vol. VI of the University series of publications in Philology, Literature, and Archæology (1897), *The Antiquity of Man in the Delaware Valley,* in which he reviews the evidence as to the existence of remains of Palæolithic or pre-Indian man in the Trenton gravels. The ancient argillite quarry discovered by Mr. Mercer at Gaddis Run, near Point Pleasant, Bucks County, in May, 1883, is described. This quarry, he states, was worked by the Lenni Lenape Indians probably as late as 1700. The general tendency of his argument and investigation is against the opinion entertained by some of the high antiquity of man in the Delaware Valley.

Florida.—The remarkable archæological collections made by Mr. Frank Hamilton Cushing at Marco, on the southwest coast, on his expeditions in the spring of 1895 and the winter and spring of 1896, are temporarily arranged in the Pepper Clinical Laboratory.

A detailed report by Mr. Cushing on his explorations, with illustrative plates and maps, will shortly appear in No. 153 (Vol. XXXV) of the *Proceedings of the American Philosophical Society.* The crania and other skeletal remains obtained by Mr. Cushing from the muck deposits and mounds are being studied for publication by Dr. Harrison Allen.

Lieutenant Hugh L. Willoughby, who has just returned from his scientific expedition across the Everglades, has presented several interesting archæological objects collected in

South Florida. From the Ten Thousand Islands he obtained perforated disks of coral-like stone (12,789–91), probably used as sinkers, and a piece of manatee bone (12,787) apparently cut for use as an implement. He has also presented two balls of deer skin (19,841–42), made and used by the Seminole Indians, which supplement the ball raquets, given last year by Mr. Henry G. Bryant.

Lieutenant Willoughby again succeeding in shooting two crocodiles (*Crocodilus Americanus*), one of which, thirteen feet long, he presented to the Biological School of the University. The skin is being mounted for exhibition.

He reports that the Seminoles do not appear to be diminishing in number, and those in the Everglades are living in precisely the same state as they did hundreds of years ago. They only come out to the coast to do a little trading, and then retreat to the interior. They still avoid all contact with the whites, except at such times. He collected a large Seminole vocabulary.

Georgia.—Clarence B. Moore has presented a burial jar, very perfect in form and 14½ inches in height, with its contents, the skeleton of a child, from Ossabow Island, Bryan County.

Maine.—Mr. Mercer described the aboriginal shell-heaps on York River, which he explored in 1891, in Vol. VI of the University's publications in Philology, Literature, and Archæology. The human bones, found in the shell-heaps, revealed traces of cannibalism.

Maryland.—The Indian ossuary on the Choptank River, Dorchester County, explored by Mr. Mercer in 1892, is described by him in the same volume.

Prof. Cope contributed an account of the physical characteristics of the skeletons, and Dr. R. H. Harte, of the University, of an examination of one of the skulls with reference to traces of disease. The report is illustrated with figures of crania (9680, 9685, 9697) in the Museum.

New Jersey.—Figure 6 represents a curious carved stone in the collection of Prof. Maxwell Sommerville, found near the Delaware River, below Montague.

It consists of a natural water-worn pebble, flat on one side, and about 2½ inches in its greatest diameter. The upper surface has been carved with finely incised lines to represent an animal. The object seems unquestionably of aboriginal manufacture, and was probably used as a fetich by one of the tribes of the Delaware Valley.

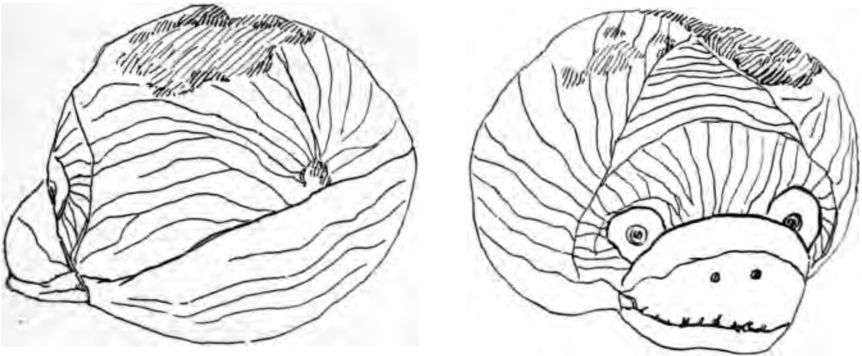

Fig. 6. Carved Pebble. Montague, N. J.
Summerville Collection.

New Mexico.—Dr. James H. Wroth, of Albuquerque, N. M., has presented a skull excavated by him in a ruined church among the remains of an extensive city some two hundred miles southeast of Albuquerque, known at the present day as the "Gran Quivira." He writes that the Spanish records of the territory of New Mexico are full of allusions to this locality as being not only populous, but famed at that time for the richness of its mines. At present it is a desolate waste, although the remains of irrigation ditches can be traced for upwards of thirty miles toward the mountains. "The magnitude of these ditches and the care with which they have been constructed, together with the extent which these ruins cover, prove that at one time it must have been the centre of a thriving population. It is supposed to have been abandoned after the insurrection of the Indians (Pueblo Rebellion, 1680), to which they were driven by the cruelties of the Spanish conquerors. As in all Spanish-American ruins, the chief interest centres in the church or temple, probably the former, of which the walls and a part of the beams comprising the roof are still standing. They show that the form of the building was a square, surrounded by smaller rooms each about fifteen feet square. Some two years since, while prospecting for minerals among

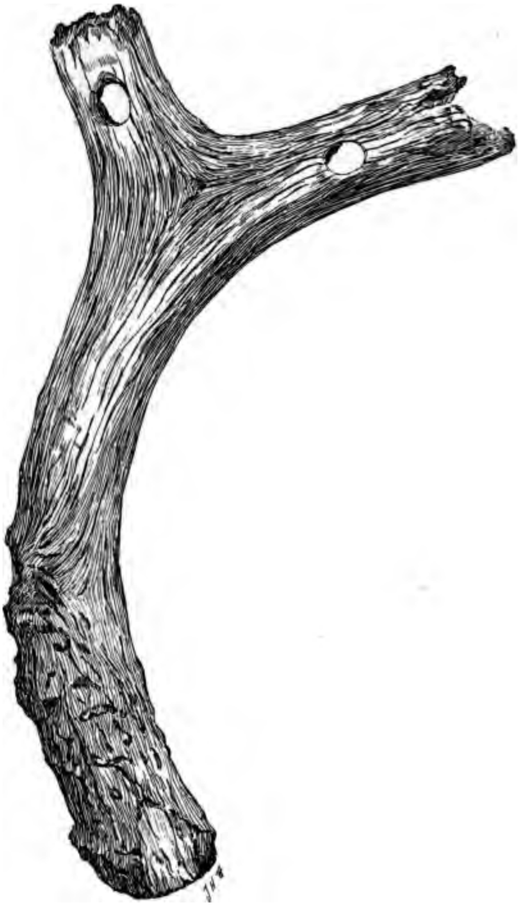

Fig. 7. Horn Arrow Straightener.
Length 9 inches. Pueblo Indians, New Mexico.
Museum of Science and Art. 19,843.

the ruins, an excavation was made in one of the rooms adjoining the body of the church, and within five feet of its main wall.” At a depth of four feet below the foundation of the church proper we came upon a mass of broken skulls, of which this and one other were the only ones intact. No other bones were found within the area of the excavation except the remains of skulls.

Mr. Cushing has presented an old Pueblo Indian arrow-straightener (19,843) (Fig. 7), made of deer-horn, with two perforations. This object, which measures nine inches in length, is of interest from its resemblance to the so-called "Bâtons de commandement," similarly perforated, found in French caves. The latter, by analogy with similar objects still in use in America, have been identified by Mr. Cushing as shaft-straighteners.

Mrs. Thomas A. Scott has given a series of ancient pans and bowls, rudely beaten by the Indians from copper, collected by Mr. C. W. Riggs at Santa Fé.

MEXICO.

Dr. William Pepper presented about 1,000 specimens of terra-cotta heads from Teotihuacan, with a large number of small objects of stone and terra-cotta from other sites, obtained by him on the occasion of his visit to Mexico in the fall of 1896.

R. O. Babbitt, Esq., of Jersey City, has given a seventeenth-century Spanish glazed jar (19,435) from Mexico. This jar, which measures seventeen inches in height, is decorated with broadly-painted figures of a rabbit, parrot, and bamboos, and is fitted with an iron cover with a lock.

In a letter accompanying it Mr. Babbitt states that it was brought to Mexico from Spain by a Padre Sanchez in the seventeenth century. It was used by him as a treasure-chest for the moneys of the church at the pueblo of Nacosari, in Sonora. The padre was killed by the Apaches in 1720. The jar passed into the possession of his brother, and was retained in the Sanchez family until 1884, when it was given by a descendant of the padre to Mr. Babbitt.

The latter also presented a fragment (19,434) of the tree of the "Noche triste," or "Sorrowful Night," the historic cypress, still standing in the Puente de Alvarado, in the City of Mexico, under which Cortez found shelter on the night of July 1st, 1520.

PERU.

Dr. Max Uhle, who has been engaged since February, 1895, in work of exploration in Bolivia and Peru for the Museum, has forwarded his preliminary report on the ruins of Pachacamac, where he has been working since March, 1896. His report is accompanied with twenty-seven plans and architectural sketches of the town; photographic negatives of the ruins (Nos. 278 to 524 and 75 to 78), and 3,575 catalogue entries of archæological objects, many of which comprise a number of specimens, excavated from the cemeteries. The greater part of the latter have been received at the Museum, and are being unpacked, catalogued, and arranged in rooms kindly placed at the temporary disposal of the Department in the Pepper Clinical Laboratory.

Dr. Uhle describes the ruins of Pachacamac as the most prominent in the environs of Lima. "The town is very ancient, dating from the time when Tiahuanuco was flourishing. Miguel Estete, the companion of the first European visitor, Hernando Pizarro, mentions that at the period of his visit it seemed ruined and decayed.

"Pachacamac is situated on the northern side of the fertile valley of the Lurin upon the dry soil of the desert, which separates the valley of the Lurin from that of Lima, about 500 meters from the sea. The ruins differ from most of those on this part of the coast in being constructed in greater part of adobe bricks. The whole town is divided into quarters, two important streets still existing, which divide the town into four parts. Where they cross, the spot is enlarged into a court-yard or market place of irregular shape. The streets are bordered by high and thick walls, and while the streets may have been used for intercourse and traffic, as is shown by the surface of the walls on the eastern street being much rubbed, as if by the passage of many people, it would appear that they were of still greater importance as lines of separation of the quarters. This separation of the interior of the quarters from the streets is complete in nearly every part.

"There are very few entrances leading to the interior of the quarters, perhaps not more than one in every quarter. On the north side a great wall incloses the town. It is probably some 900 meters long from west to east. There is only one opening on this line, on the spot where the great street, running from north to south, enters. But, as this opening is as wide as the street itself, it proves that the town was more accessible to those living outside, than the several quarters to those living in other quarters. In the last period of the ancient town, it would appear that the four quarters were not sufficient. The commencement of two other quarters are to be seen on the north side, outside the town wall, separated from the town wall by the commencement of a new street running east and west. There exist the remains of another wall on the outskirts of the town. Thus, about 700 meters from the town, we see a very thick wall, constructed of bricks, about 400 meters long, crossing an opening between two hills in the desert. This wall has the extraordinary thickness of 6.10 meters and shows a door-like opening, nearly in the direction of the northern street of the town. A greater part of it is buried by drifting sand. Its height is from four to five meters. A similar wall exists on the northeast side, running from north to south about 300 meters, and having a thickness of 4.5 meters. This latter wall is near the cultivated parts of the Hacienda of 'Las Palmas' in the valley of the Lurin, which here forms an inlet to the north. These two thick outer walls had no connection with each other. In the west we notice a kind of circumvallation, now much ruined, on the west side of the Hacienda Mamacona, this latter circumvallation forms three sides and seems to have been erected for the protection of the fields against the inroads of the sea, distant some meters from it. Traces of a similar wall are also recognizable on the southern border of the entire valley of the Lurin. It ran from west to east, and, although distant some kilometers from the town of Pachacamac, it is possible that it was erected by the inhabitants of that town for their protection."

It does not appear that Pachacamac was similar to modern towns of the civilized world in the arrangement of its buildings. The only regular arrangement consisted in the division into quarters by the streets. There are great and important houses, but they stand isolated, and are joined to the walls of the streets without regularity. Some of the houses of the ordinary people are covered by drift sand, and others are destroyed. In general they were terraced, and had an open stairway constructed of bricks, leading from the courtyard in front of the houses to the terraces. The rooms were situated higher than the terraces on the remaining three sides of them. In the rear we find nearly always rooms of another type, with high walls, and with niches in the interior, but without doors. These rear rooms could only be entered by descending perpendicularly from the top of the surrounding walls. Dr. Uhle concludes that these rooms were inhabited by inferior people, belonging to the owners who lived in the higher terraces of the house, and infers from the number of such rooms that every owner of a terraced house always had about him all the inferior people of his clan. The general disposition of the whole town in quarters was to be subdivided in clans, not by lanes and streets, but by the more rude separation of the dwelling houses they occupied.

There exists still another important difference from our modern towns. The walls of the houses and those bordering on the streets and courtyards served not only for separating the rooms, streets, etc., but in general were the most important means of communication for the people of the town, and inhabitants of the houses, who preferred the tops of the walls to the streets and lanes, this was facilitated by the general thickness of the walls (1 to 3 meters), and was certainly to be preferred to going upon the plain, which was full of sand. The height of the terraced houses is to be explained by their being built to escape the masses of drifting sand, continually brought into the town by the wind. Dr. Uhle mentions in this connection that in the ancient town of Quilmes, in the interior of the province of Tucuman in Argentina, the house-walls also serve as the only " roads " existing there, separating the houses as the cell-walls do the honey-cells in a bee-hive.

" The eastern part of the town of Pachacamac impresses one as being less organized. We observe there fewer terraced houses (only two or three). The division of the whole into quarters was not carried out in this extreme section."

ASIA.

THE FAR EAST.

China.—Dr. Divie Bethune McCartee (M. D. 1840, A. M. 1848), of Tokyo, whose library of Chinese and Japanese books, presented in 1887, constitute the basis of the valuable collection of the literature of Eastern Asia in the University Library, has sent from Tokyo a rubbing (19,121) from the inscription of the Syrian or Nestorian monument at Si-ngan-fu in the province of Shen-si in Northwestern China.

In a letter, accompanying the gift, Dr. McCartee states that the rubbings from the inscription are used as writing copies to this day, the calligraphy of the Tang dynasty (A. D. 618 to 709) being still universally admired by Chinese scholars. The Syriac characters are generally taken for Manchu or Mongol characters, which they closely resemble.

With the inscription is a photograph (19,122) purchased with the rubbing at the *Presbyterian Press* in Shanghai. The photograph, in Dr. McCartee's opinion, is not taken directly from the monument, but from a rubbing which has been ingeniously pasted upon a wooden block.

Dr. Stuart Eldridge, of Yokohama, Japan, has presented a Chinese fire-lock (17,760) picked up in the field after the battle of Kui Chow in the recent Chinese-Japanese war. This gun, which measures 43 inches in length, and is painted red, formed part of a collection of ethnological objects given by Dr. Eldridge to the Museum, and transmitted through Dr. William H. Furness, 3d, and Dr. H. M. Hiller on their recent visit to the East.

Japan.—Important accessions have been received from Mrs. Phebe A. Hearst, of Washington, D. C., consisting of a carved and gilded shrine (19,875), a Buddhist temple screen (19,873), a group of Buddhist images (19,876), a Buddhist temple picture (19,874), a set of three Buddhist kakemonos (19,880), seventeen carved masks, used in the Bungaku dances, a suit of armor (19,879), helmet (19,877), saddle (19,878), stirrups (19,882), and horse's head-piece (19,881).

The shrine is a structure of wood five feet in height. Four gilded columns, around which dragons are entwined, support the roof, which is covered with gilded carvings, in which the plum flower, bamboo, and pine are combined with the stork and tortoise, emblems of longevity. The ridge-pole is surmounted by fish and dragons, between which rises a flame-shaped ornament. The temple screen, of carved and gilded wood, measures about ten feet in length and six feet in height. Its frame is of gold lacquer. In the centre are two sliding lattices, surrounded by elaborate gilded carvings of peonies, to which two representations of the Ho-ho bird are applied. Similarly carved and gilded dragons are attached to the base. From the character of the decoration it is to be inferred that the screen was made for one of the imperial temples in the seventeenth or eighteenth centuries.

The Buddhist images represent the Buddhist trinity. On the base of the central figure is inscribed: "An offering from Uji-no-meton and Uji-no-murono (twin sisters). Made by Hori-Kawa, Shijo Street, Kyoto."

The picture represents the Nirvana of Sakyamuni, the Buddha being represented in the usual manner, lying upon his left side, surrounded by his disciples and the principal personages of the Buddhist Pantheon, who are bewailing his death.

The kakemono measures twelve feet six inches by thirteen feet six inches, and was obtained in 1873 from the Buddhist temple at Shiba, on the outskirts of Tokyo, at the time of the partial transfer of the temple to the Shintoists. This temple was destroyed by fire on the 1st of January, 1874.

The following is an abstract of a memorandum accompanying the masks: "The Bungaku dance, in which the masks are used, is semi-sacred and pantomimic in its character, and usually performed by a single individual, although to this there are exceptions. It was under the direct patronage of the imperial court and the nobility of the highest rank." The names of the masks are given as follows:[1]

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[1] See the paper on "No Masks," by F. W. K. Mueller, in the *T'oung Pao*, Vol. VIII, No. 1, March, 1897.

19,856. Bu Aku.
19,857. Kan joraku.
19,858. Han Ki.
19,859. San Jin.
19,860. Ra rio.
19,861. Dai Aku.
19,862. Bu Sho.
19,863. Han Ya.
19,864. Bon den.
19,865. Riku Ghan.
19,866. Binga.
19,867. Fujin.
19,868. Seko Seneen.
19,869. Beyshime.
19,870. Gen jio raku nomen.
19,871. Tengu.
19,872. Kokobo.

The masks are old, carved with great skill, and painted in brilliant colors. Each has a Sanskrit character incised in the wood on the inner side.

The suit of Japanese armor is one of the much-prized red-braided silk suits, and bears the crest of the Daimio Ii-Kamon-no-Kami Năosuké, a device formed of the Tachi-bana (bitter orange) and Sakura (cherry blossom). Concerning the origin of the red-braided silk suits, it is related that in the year 1600 a brilliant and decisive battle was fought at Sekigahara between the troops of Ieyasu (the first of the Shoguns) and those of Hideyori. The former was led by Ii-no-wo-maso, who wore a suit of white silk braid. At the close of the battle the victorious Ii-no-wo-maso received so many wounds that his armor was literally stained with blood. Ieyasu, in commending him for his valor, presented him with a red silk-braided suit as a recognition of his personal bravery, adding his sentiment as to the unfitness of a white-braided suit to a general of his fearless character. It may be remembered that the other Samuri wore suits with red silk braids, but the red was not of the same distinctive tint as that originated and worn by the Ii family.

Ii Kamon-no-Kami was regent during the interval preceding the election of a new Shogun, and a man of rare sagacity and favorable to foreign intercourse. He was assassinated in broad daylight by the emissaries of the Prince of Mito, who was desirous of seating his own son on the throne in the year 1861. There was exhibited at the World's Columbian Exposition in 1893 a life-size statue of the Baron Ii in the full costume of his rank, sculptured by Shima Sekka, who afterward presented it to the United States National Museum, where it can now be seen.[1] The string of the head-dress and the tablet held in his hand are those which were actually used by this illustrious man.

From the account accompanying the armor presented by Mrs. Hearst, it appears that it probably belonged to a general in the service of the preceding Daimio Ii.

These objects were exhibited in Horticultural Hall on January 15th and 16th, on the occasion of a lecture by Professor Edward S. Morse, of Salem, on "Japanese Archæology" before the University Archæological Association, when a loan collection of Japanese art was displayed.

An interesting feature of this exhibit was an old Japanese drum, contained in a pavilion of unpainted wood, lent to the Museum by Mrs. William Frishmuth, whose valuable collection of musical instruments are intended for the new Museum. The structure measures eleven feet in height, and is surmounted by a gilded drum, upon which a cock is perched.

Objects were loaned for the exhibition (which was open free to the public on the Saturday following the lecture) by Mrs. John Harrison, Mr. John T. Morris, Mr. Carl Edelheim, Mr. Edward Starr, and Messrs. George and Edward Farnum, the latter contributing a beautiful series of ancient embroidered temple hangings.

Mr. Edward Starr has given a Japanese priest's baton, or *ni-yo-i* (19,422), of vermillion-lacquered carved wood. This interesting object is twenty and one-half inches long and one and one-half inches in width, nearly rectangular in section, the inner side being slightly concave and the outer correspondingly convex. It is bent in a graceful curve, like a bow, near the upper end, which terminates in a scroll-shaped knob. A gilded dragon is painted around the baton, which is pierced about one-third the distance from the lower end for a purple silk cord, tied in a peculiar knot and having the ends intertwined and terminating in tassels. The *ni-yo-i* is used in Japan by the high priest of the Zen sect, who employs it to correct the catechumens. It is an importation into Japan from India by the way of China. In the latter country it is given at marriages and to friends for good luck, and is frequently inlaid with jade and beautifully carved. Its name, *ni-yo-i* (Chinese, *ju i*), means literally "as you wish." In India it forms one of the *Sapta Ratna*, or "Seven Precious Things," which constitute the insignia of a Tchakravatti. The *ni-yo-i* is analogous in form to the Etruscan lituus, or augur's wand. Its origin presents a problem of peculiar interest and difficulty. In the opinion of the writer of this note, it is not unlikely to have been derived from the "throwing stick," or, possibly, the bow.

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[1] See *Report of the United States National Museum for* 1884, p. 621.

Dr. McCartee has presented an interesting Japanese sword (19,424), given to him by Mr. Takahashi Kenzo, now Chief Secretary to the Cabinet of the Imperial Government, and formerly principal editor of the *Official Gazette*. He gave this sword to Dr. McCartee about twenty years ago, when the Doctor gave up his professorship in the University of Tokio, and Mr. Takahashi was one of his pupils. Mr. Takahashi said the sword had been in his family for three hundred years. Mr. Benjamin Smith Lyman, who has examined the sword, states that it looks old, and worn quite narrow by repeated grinding. There is no inscription on the tang. The grooves of the blade run far along the tang. The sword seems, therefore, to have been shortened from the length of a *katana* proper (30 to 33 inches) to that of an *ipponzashi* (single sword) worn by tradesmen and farmers, and between the *katana* and the *wakizashi* in length, or, say, about 25 inches. The blade is at present very much tarnished and rusty, so that it is hardly possible to judge of its quality.

Dr. John Marshall, Dean of the Medical Faculty, presented a pair of modern Japanese badger fur slippers (19,805).

Included in the collection, presented by Dr. Stuart Eldridge are two Ainu mustache sticks (17,740 and 17,741), an Ainu bow (17,765), quiver and arrows (17,751), and two Ainu hunting knives (17,743 and 17,744) in carved scabbards.

Korea.—Dr. E. B. Landis has sent from Chemulpo two "name tablets" *ho-hpai* (19,845 and 19,846) consisting of small tablets or labels of unpainted wood, 3½ inches in length by ¾ broad and $\frac{3}{16}$ thick. The following account of the *ho-hpai* was given by Mr. Culin in work on *Korean Games:*

"When a free-born boy reaches the age of fifteen he has a small wooden label cut, which he carries with him. This label is called *ho-hpai* (Chinese *hŏp'ăi*) 'name tablet,' and is made of pear wood or mahogany, and is about two inches in length by one-half in breadth. It is inscribed in Chinese characters. Across the top is the name of the *pou* (Chinese: *pú*) or ward, to which the boy belongs. There is a line below the designation *han-ryang* 'leisure fellow,' that is, 'not in service,' and the boy's name with the date of his birth. The date on which the label is made is cut on the reverse. This label must be sealed by an official of the treasury, who brands it with a hot iron, and registers the boy's name and other particulars. When the boy enters the *tjin-să* (Chinese: *tsun'sz*), he has another label cut, this time of boxwood, with his proper title instead of *han-ryang*. Upon passing the military or civil examination, the

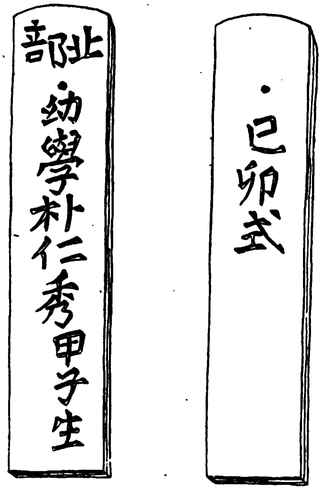

Fig. 8. Ho-hpai, "name tablet."
Length 3½ inches. Korea.
Museum of Science and Art. 19,845.

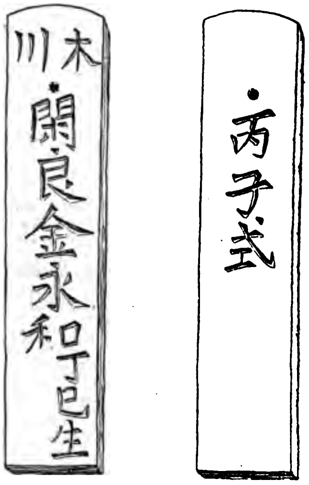

Fig. 9. Ho-hpai, "name tablet."
Length 3½ inches. Korea.
Museum of Science and Art. 19,846.

label is cut from black horn, and upon obtaining the first grade, an ivory label is permitted. The free-born boys jealously guard their right to carry the *ho-hpai.*"

Dr. Landis' letter, accompanying the gift, furnishes some interesting particulars. He says: "I have simply had reproductions made, as they are not in use since the war. They are, however, exact reproductions, with the exception of the magistrates' seal, which was always burnt in on the back. At the top, reading from right to left, is the place of residence. Below are the words *Yon-hak* and *Han-ryang*. These refer to the class of society to which he belongs. The first is 'patrician,' and the second 'plebeian.' After this follows the name and surname, and in the lower corner the year of the birth. On the back is the year when the *ho-hpai* expires. It is renewed every three years. There is another kind, called *yo-hpai,* which was used by the servants of the various officials as proof of identity when drawing their monthly wages, which was always in kind. I will send them to you by the next mail, as at present they are not finished."

Siam.—Prof. Maxwell Sommerville, the founder and curator of the Section of Glyptics, has just published an account of his travels in Siam in 1895. (*Siam, on the Meinam River from the gulf to Ayuthia; together with three romances illustrative of Siamese life and customs.* J. B. Lippincott & Co. 1897.)

The author collected on this visit to the East a large number of East Indian amulets and talismans, and the entire furnishings of a Buddhist temple. The latter will be erected in one of the halls of the new Museum.

ISLAND—ASIA.[1]

The valuable and interesting collection from Borneo and the Liu-Chiu Islands made for and presented to the Museum by Dr. William H. Furness, 3d, and Dr. H. M. Hiller, on their recent visit to the East, has been temporarily arranged for exhibition in the upper hall of the Wistar Institute, the crowded state of the Museum not permitting its display.

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[1] From the German "Insel-Asien," which has been adopted by most ethnological writers.

Dr. Furness went out in the interest of the Museum, and was accompanied by Dr. H. M. Hiller, of Philadelphia. They were joined in Yokahama by Mr. James Wilder, of Honolulu. The party started for Borneo in October, 1895, and stopped on the way for a short time at the Liu-Chiu Islands. They voyaged in a schooner which they bought for the purpose in Yokahama. After a stay of some weeks in the islands they went to Hong-Kong, where they disposed of their schooner, as they were told that it would be of little use on account of light winds. They therefore went by steamer to Singapore, and thence sailed about May 1st to Kuchang in Borneo. The two explorers returned to Philadelphia in December, 1896, after an absence of over a year. An account of their ethnological collections will appear in the next number of the BULLETIN.

BABYLONIA.

The growth of the Babylonian Section of the University Museum during the last few years has been closely connected with the Imperial Ottoman Museum in Constantinople. In 1893 Professor Hilprecht was requested by the Ottoman Government to submit a report on the steps necessary for protecting the numerous Babylonian ruins from pillage and destruction by the Arabs, to reorganize the Semitic Section of the Imperial Ottoman Museum, and to prepare a catalogue both of the Babylonian and Hittite collections.

The time and work required for the carrying out of this mission and the interests of the Babylonian Expedition of the University, made it necessary for the Curator to spend the greater portion of summer and fall during 1893, 1894, and 1896 in Constantinople and in Asia Minor. In acknowledgment of his services, His Majesty, the Sultan, presented a very large number of valuable antiquities excavated in Nippur, to the Museum of the University, through its Curator, granting him at the same time permission to have all such objects in the different sections of the Imperial Museum as desired by him for scientific research cast for our University. In consequence of this generous offer a number of casts have been added to our Semitic collections, among them the stele of Naram-Sin (about B. C. 3750); the Phenician inscription on the sarcophagus of King Tabnit, of Sidon, excavated by Hamdy Bey (about B. C. 300); the only cuneiform inscription so far excavated in Palestine (about B. C. 1400); a number of Hittite inscriptions, Sabaean and Minean monuments, and several important cuneiform documents, excavated by the American, English, French, and Ottoman expeditions in Babylonia and Assyria.

The latest results of the University's expedition in Nippur, excavated by its present director, Dr. J. H. Haynes, during 1895 and 1896, for some time past have been on their way from Jedda in Arabia to Constantinople, and arrived at the Imperial Museum very recently. They comprise about 120 large boxes of tablets, bricks, pottery, and objects of art of the earliest period of Babylonian civilization and over 30 large, well-preserved sarcophagi. To examine them, Professor Hilprecht is expected to start again for Constantinople.

About five months of concentrated work will be necessary to unpack, examine, and catalogue these antiquities. In connection with this work the Professor has been requested by the Museum of the University to arrange for their publication at an early date, and to obtain an extension of the University's firman for renewed excavations in Nippur in the fall.

When in 1888, at the initiative of Professor Hilprecht, the first section of the Museum of Archæology of the University of Pennsylvania—its Semitic Section—was created, he himself being appointed its Curator by the Trustees of the University, this step was taken in view of the Curator's urgent request for objects illustrating life and customs of the various peoples of the Old Testament to the growing number of theological and philological students in the University. The cordial relations which were established between the great Ottoman Museum and the University gave a fresh impulse to the growth of this Biblical Museum. No other nation of the ancient world stood in such a close contact with the Hebrews as the Babylonians and Assyrians, whose monuments have done so much to prove the historical accuracy of the Old Testament books.

It was therefore natural that the Babylonian collections should form the nucleus of this Museum, especially as up to date very little has been done in the line of systematic excavations in Palestine. But through Hamdy Bay's praiseworthy efforts, two other nations, the Hittites and the Phenicians, and through the four successful and dangerous exploring tours of Dr. Edward Glaser of Munich, the Sabeans, and Mineans, and also through the excavations in Senjirly by the Berlin Oriental Committee, the Northern Aramean tribes can now be studied from their own monuments. Professor Hilprecht has, therefore, been busy during the last few years to secure casts of the most important monuments of these five nations from Constantinople, Berlin, and from private collections, to strengthen the Biblical Museum which he has been planning for nearly ten years.

Owing to the lack of space in the present Library Building, most of these casts and thousands of Babylonian originals had to be stored away, inaccessible to students. As soon, however, as the new Museum building will be opened, an especial room will be set apart for a systematical and historical illustration of the life, customs, burial modes, etc., of the Old Testament people. This room, to be known as the Biblical room, will stand in organic connection with the other Semitic Museum, so that those monuments which really illustrate the Old Testament, will be grouped together.

The Imperial Ottoman Museum, which receives the chief results of all excavations and explorations carried on in its vast domain, has gracefully consented to support Prof. Hilprecht in his efforts by furnishing him all the casts necessary. A pair of casts of two large Hittite sphinxes, which he selected last summer for flanking the entrance to the Biblical room, are in course of preparation now in Constantinople. A number of coins, mentioned in the New Testament, have already been procured by the Curator, and it is his intention to make new, vigorous efforts in connection with his proposed trip to the East in the course of this summer to complete his collections by procuring, among other objects, a number of photographs of recently discovered Bible manuscripts, especially of the famous Purple Codex, obtained by the Czar of Russia last year after Prof. Hilprecht, knowing its hiding place in Asia Minor, had tried in vain in the previous years to raise the necessary money for its purchase in Philadelphia. A Jewish Synagogue roll of the Pentateuch and a lectionarium, such as he bought recently for a theological seminary in America, and many other antiquities illustrating the contents of the Bible, will be provided.

The recent additions to the Museum are the following:

1. The large collection of Babylonian tablets, bricks, sarcophagi, etc., referred to above as having been presented by His Majesty, the Sultan.

2. A collection of over three hundred beautifully preserved Neo-Babylonian tablets, dated in the reigns of Artaxerxes I and Darius II, presented by Prof. H. V. Hilprecht, and with other antiquities previously presented by him, known as the "Hilprecht Collection."

3. Through the efforts of Dr. William Pepper, a valuable collection has been presented to this section by Miss L. F. Massey, of Toronto, in memory of Hart Almerrin Massey. This collection was obtained by the Curator in the East, and comprises about twenty new Kappadokian cuneiform tablets and pre-historic celts and smaller objects from the same region; the earliest Babylonian document in existence (about B. C. 6000); a beautiful long inscription of King En-gegal of Tello, known only from this stone (see Hilprecht, *Zeitschrift fuer Assyriologie*, XI, p. 330, f.); a new document referring to Sargon I (B. C. 3800), and the famous vase of Artaxerxes in four languages.

4. A number of bricks of Nebuchadnezzar II (B. C. 600); fragments of Assyrian marble slabs and a few other objects presented by Mrs. Phebe A. Hearst, of Washington.

In connection with the Babylonian acquisitions, it should be mentioned that Mrs. Phebe A. Hearst, who very generously has contributed to various sections of the Museum, deposited an exquisite collection of Greek antiquities in the Museum, in the acquisition of which the Babylonian Curator was instrumental.

It contains sixteen good sized painted Grecian vases, of which ten are entirely intact, and formed part of the collection of the last Khedive of Egypt; a silver Venus (used as a hairpin); a silver dareicos, found in Kutahia, Asia Minor; a well-preserved bronze vase of the Hellenistic period, a small bronze mask, a bronze handle of a kantharos, representing a satyr and a mouse, and two very valuable small bronze statues in excellent preservation, one of rare beauty, and the other of a unique design.

The second part of the Curator's *Old Babylonian Inscriptions, Chiefly from Nippur* (being Vol. I of Series A of the Babylonian Expedition of the University of Pennsylvania), was published by the American Philosophical Society in the course of the last year. He also, in connection with a number of American and European scholars, published *Recent Researches in Bible Lands* (John D. Wattles & Co., Philadelphia), to which he contributed the historical sketch of "Babylonian Excavations by American, French, and Ottoman Expeditions during the last years." For the *Holman S. S. Teachers' Bible* he wrote and illustrated the archæological section. Vol. IX, Series A of the Babylonian Expedition of the University of Pennsylvania (Tablets, dated in the reign of Artaxerxes I, by H. V. Hilprecht and A. T. Clay), published through the liberality of Mr. Eckley B. Coxe, Jr., is in press now, and will appear at the beginning of June. Vol. I, part 3, Vols. II, VI, X, and XI, of the same series A of the inscription work, are in course of preparation. Dr. J. H. Haynes' *Narrative of the Latest Excavations in Nippur*, as expanded and supplemented by H. V. Hilprecht, will be published at the end of this year. The first part of Series B, Vol. II, *Babylonian Seal Impressions from Dated Documents*, by H. V. Hilprecht, will appear at the end of 1897. *Aramaic and Hebrew Bowls*, by R. Gottheil and Morris Jastrow, Jr. (Series B, Vol. IV), in course of preparation. Other volumes will follow as soon as time and material permit. Dr. John P. Peters' work, *Nippur; or, Explorations and Adventures in the Euphrates*, in two volumes, is also announced, Vol. I being nearly ready.

AFRICA.

EGYPT.

Among the important historical pieces which, through the kind interest of Professor Flinders-Petrie, have recently found their way into the possession of the Egyptian section of the Museum is an inscribed block of limestone, still showing faint traces of the original painting, which was secured by him at Zowaydeh, near Ballas (Upper Egypt).

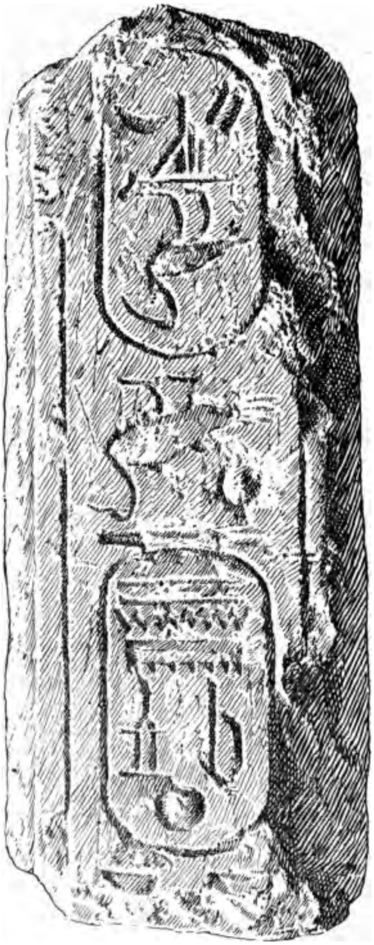

Fig. 10. Inscribed block of Limestone with name of King Ra-Seshes-men-taui. Egyptian Section. Museum of Science and Art.

This block gives the full names of a king, Ra-Seshes-men-taui, Son of Ra-Tahuti, of whom but a single vestige until now was known.

The existence of a King Tahuti was recognized some years ago by Professor Erman, who discovered this name mentioned as that of a King of the divine Solar line upon a canopic box in the Berlin Museum. (*Æg. Zeitschrift XXX*, 4.)

Our monument now furnishes us with the throne name of the monarch, which seems to locate him in the obscure period of the thirteenth dynasty (2500–2200 B. C.), as two of the Sebekhoteps bore similar names—*i. e.*, Ra-seshes-Khu-taui and Ra-seshes-suaz-taui. Mr. Maspero, however, regards it as likely that his reign was not far distant from that of Ua-ab-ra-Her (see *Maspero Rev. critiq. d'Hre et de Littérature*, 15 *février*, 1897), whose mummy, funeral outfit and marvelous Ka-statue were recently discovered by Mr. de Morgan in his royal tomb at Dashur.

This interesting block had been trimmed and re-used in some later building, and was brought to Mr. Petrie whilst he was working at Deir during the winter of 1895 by a Fellah, who had come upon it when digging for sebakh.[1]—*Sara Y. Stevenson, Curator.*

Savage Tribes.—In 1890 Dr. Robert H. Nassau collected for the Museum a representative series of objects—weapons, utensils, musical instruments, etc., together with eleven crania from the Fans of the Ogove River. Another important collection of African ethnology, comprising 145 catalogue entries (18,882 to 19,036), has recently been deposited by Dr. A. Donaldson Smith. These objects were obtained by Dr. Smith in 1894 and 1895 on his expedition to the Lakes Rudolf and Stephanie in East Africa. The following tribes are represented: Somali, Arusa Galla, Dogodi, Gêre Galla (Badi), Gêre Galla (Libin), Sakuya, Gabbra, Boran, Amara, Konso, Arbore, Burle, Dume (Pigmies), Bunno, Reshiat, Kere, Mela, and Rendile.

A descriptive catalogue of the collection, prepared by Mr. Culin, has been published by Dr. Smith in his work, *Through Unknown African Countries* (Edward Arnold, 1897), in which also the greater part of the objects are figured from drawings prepared in the Museum. In addition to the ethnological material, Dr. Smith also deposited in the Museum a collection of eighty-two heads, skulls, tusks, and skins (19,037 to 19,089) of large mammals shot by him on his expedition, which have been in part described by Professor Samuel N. Rhoads in the *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1896, p. 517. The entire collection is now displayed on the landing of the tower stairway in the Library Building.

From Mr. Seaton-Karr a series of eighteen rude-flaked stones (13,219 to 13,236), collected by him in Somaliland, have been obtained by exchange. These objects, regarded by Mr. Seaton-Karr as palæolithic, are described and figured in the *Journal of the Anthropological Institute.*

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[1] See *Nagada and Ballas*, 1895, p. 8.

EUROPE.

RUSSIA.

Early last year it was foreseen by Dr. William Pepper, the President of the Department of Archæology, that the festivities attending the coronation of the Czar at Moscow, when the representatives of the Russian Empire were expected to assemble, would afford an unusual opportunity to collect ethnological material. Through the liberality of Mrs. Hearst it became possible for the department to send Mrs. Zelia Nuttall on a mission to represent the Museum.

Mrs. Nuttall was peculiarly qualified for this important and arduous undertaking. Speaking the Continental languages fluently, she was also personally acquainted with the leading archæologists of Europe.

She has pre-eminently distinguished herself by her archæological and ethnological studies in America, and her work on the Mexican Calendar, which she first presented at the Congress of Americanists at Huelva, has attracted the attention of the entire scientific world.

Provided with letters from the Department of Archæology, the Mayor of Philadelphia, and the State Department at Washington, she arrived in Moscow in May. Here she at once arranged important exchanges for the Museum with the principal scientific institutions of that city. From Professor Anutchin, the Director of the Anthropological Museum, she obtained by exchange a set of casts illustrating the prehistoric stone and bronze implements found in Russia. Mrs. Nuttall had sent to her from Philadelphia three cases containing American prehistoric implements, so that she was enabled to proceed directly with the negotiations. An equally important exchange was made with Professor Müller, the Director of the Ethnological Museum. At the Historical Museum she arranged with Mr. Sissoff to have models made for Philadelphia illustrating the different forms of burial, typical of different ages and civilizations of prehistoric Russia. The publications presented to Mrs. Nuttall in Moscow form a most important addition to the Museum Library. Foremost among them are the superbly illustrated reports of the Imperial Archæological Russian Commission, which were transmitted from its President, Baron von Tiesenhausen, of the Hermitage Museum, through the Department of State at Washington. With them were two silver ingots found in the Government of Mohileff in 1893.

The Archæological Society of Moscow also gave a set of its publications, consisting of between forty and fifty volumes, nearly all with beautiful plates. These works are indispensable in the study of the prehistoric remains of Russia. The Countess Ouvaroff, President of the Society, was specially helpful. She presented a number of books by her late husband, Count Ouvaroff, whose scientific work she continues, as well as a collection of pottery fragments and bone and stone implements from excavations made by the Count on his property in the Government of Vladimir. Professor Ilovaisky, the foremost historian for Russia, who has written all the school histories, gave a complete set of his publications.

At Moscow it was reported that the preparations for the Fair and Exposition at Nijnii Novgorod were much delayed, and that while ethnological material could be obtained there, it would not afford much opportunity to secure archæological collections. Mrs. Nuttall accordingly determined to visit Kiew in the interests of the Museum. Kiew is a thirty hours' ride from Moscow and distant 566 miles. Here is the famous Cathedral of St. Sophia, the oldest in Russia, and the monastery, the Kievo-Petcherskaya, which is the chief establishment of its kind in Russia, and resorted to annually by about 350,000 pilgrims. Mrs. Nuttall purchased some of the curious wooden spoons carved with fish, the emblem of Christ, and a hand bestowing benediction, which are made for sale to these visitors. At Kiew an exchange of publications was effected with the Société du Chronique Nestor of the University, and Vladimir Antonovitch, the Professor of Anthropology at that institution, presented his valuable archæological map of the Government of Kiew. He also engaged to collect typical antiquities of the stone and iron age for the University Museum.

On the 1st of July Mrs. Nuttall again left Moscow and visited Troitzkoi and Rostow, whence taking the steamer down the Volga she arrived at Nijnii, on the 8th of the month. Here, to signalize the event of the coronation, was held a Pan-Russian Industrial and Art Exhibition. Its Commissary General, His Excellency V. T. Timirazyeff, had been a commissioner at the Philadelphia Centennial. He and his aid, A. V. Dobraniziki, spoke with the utmost pleasure of their stay in Philadelphia, and expressed their greatest interest in our Museum. The ethnological material at the Exposition was not very large, but made up for quantity in quality. The Asiatic department presented a wonderful opportunity. There were three sections, the Bokharan, the Trans-Caspian and the Dungan, and Kirghiz. The specimens purchased, which have been received in Philadelphia, are very remarkable. Among them is a woman's costume from the Dunganes, an interesting tribe of Mussulman Chinese, subject to Russia; the costume of a Teke man with long coat, fur cap, sash and whip, and a set of musical instruments from Tashkend.

The chief importance of Nijnii is ordinarily due to the fair which is held annually from the 5th of August to the 15th of September. The settled population of the town is about 60,000, but it rises then to 250,000 to 300,000. From remote antiquity the Russian merchants were accustomed to meet in summer with those from the East at different places on the Volga. The fair has only been held directly at Nijnii since 1817. The Jahrmarka is a wholesale fair, the extent of which can be estimated by the total of the business transacted, which amounts to about 300,000,000 roubles ($150,000,000). Cotton, woolen, linen, and silk stuffs constitute about forty per cent. of the whole, with iron, corn, teas, furs, wine, fish, pottery, and manufactured goods coming next in importance. Two other fairs are also held at Nijnii—one for wooden wares is held on the ice, and another for horses in June. The Jahrmarka is held in a suburb connected with the town by a bridge of boats 1,500 yards long, which is entirely removed in winter.

The shops of the fair, more than 3,000 in number, are built of stone in regular rows, are surrounded by a canal, and cover half a square mile. The bridge is a favorable point for observation, swarming with people all day long until 2 o' clock in the morning.

Here are to be seen the Tartar workmen with their marked Mongolian features, high cheek bones, brown skins, and shaved heads covered with a cotton skull cap. Occasionally, too, one sees Persians and Armenians wearing Astrakhan fezzes or voluminous turbans, their long garments floating majestically as they walk. Often, too, Tartar women, closely veiled in Mussulman style glide along discreetly. Mrs. Nuttall describes the ceremonies at the opening. It was a curious spectacle. Service was held. A Te Deum was chanted in the central chapel, next to which flag-posts are raised. At a given signal the two flags were hoisted—one for the merchants of the upper, and one for the merchants of the lower town. According to the way their respective flags unfurled and fluttered in the breeze, it is decided whether the fair will be a success or not. After this operation has been observed by the crowd with painful and eager interest, the gilt-robed priest issued from the chapel, and followed by the Governor and Mayor, etc., and carrying the holy image and gilt banners, went in procession to the fair, sprinkling holy water around.

The church parade, consisting of 100 soldiers, also filed past, with their band playing. At that time there were scarcely any buyers, owing to the imperial visit, but the streets with antiquity shops were full of venders. One must penetrate into small low rooms, around which countless old clothes are hanging—cast-off fur cloaks and coats next to brocade Russian costumes. Space would not permit the recital of all the curious things brought here for our Museum. A brocade national outdoor dress, such as was worn by the nobility and merchants' wives until about twenty-five years ago, is among them. It consists of a heavy red silk sarafaw, or petticoat, and a fur-lined and trimmed coat and jacket to match, with a beautiful red velvet cap. With this are embroidered gloves and a silk vest interwoven with gold. The old national costume of Russia has practically gone out of use. A search through three villages yielded only a single caftan, or sleeveless jacket. The oldest women alone remember what the old national dress was like. All the gold-embroidered caps have long since been carried to the churches to be melted down for the gold on the threads. Besides the dealer has been around and taken all.

It is indeed the highest time to collect in Russia, if at all. In a few years it will be impossible to get anything at any price, for the Russian ethnological museums are awakening to the fact that now or never they must assemble and preserve all relating to national costumes and customs.

The last place of importance in Russia visited by Mrs. Nuttall was Riga. Here she participated in the Archæological Congress, which brought together all the foremost scientists in Russia, made exchanges with a number of the scientific societies of the Baltic provinces and secured a series of costumes and other objects of the Finnish race, the Letts and Esthoniens. To the many objects obtained by gift, purchase, and exchange Mrs. Nuttall added some interesting souvenirs of her visit, which will be displayed when the Russian exhibit is formally installed in the new Museum building.

SPECIAL COLLECTIONS.

Fans.—The formation of a collection of the fans of the world has been undertaken by Mrs. Joseph Drexel, who has contributed thirteen specimens of European fans of great beauty and value:

19,441. Spanish fan. Segovia.
19,442. Vellum marriage fan. Early Louis XVI.
19,443. Mourning fan.
19,444. Dutch fan.
19,445. Painted fan. Dismissal of Hagar. Louis XVI.
19,446. Vernis Martin. France. Early Louis XV.
19,847. Painted fan. Louis XVI.
19,848. Painted fan. Judgment of Paris. Louis XVI.
19,849. Chinese fan, carried at the Meschianza by Elizabeth Gordon.
19,850. Chinese enamelled metal fan.

19,851. Chinese ivory fan. Eighteenth century.

19,852. Carved ivory fan, wheat and roses. Nuremberg. Eighteenth century.

19,853. Horn fan.

The Museum possesses a series of Korean fans, and a valuable collection of fans and carved ivory fan handles from the Marquesas Islands.

Games.—The collection of games has been augmented by a gift from Mrs. Joseph Drexel of six packs of German playing cards (19,436 to 19,440 and 19,444), and an interesting pack of old Nuremberg cards: "Reisen in den fuenf Welttheilen" (19,410) presented by Mr. Charles T. Heaton through Joseph G. Rosengarten, Esq.

Mrs. Zelia Nuttall also collected two sets of modern Russian chessmen in Moscow, one consisting of miniature iron figures, representing the campaign of Napoleon. In Nijnii-Novgorod she purchased a set of Khirghiz chessmen at the Pan-Russian Exhibition.

The last publication referring to the collection consisted of a monograph on the game of "Mancala" (Report of the United States National Museum, 1894), by Mr. Culin.

The catalogue of the collection, sent by the Museum to the Atlanta Exhibition through the Smithsonian Institution, will appear in the report of the United States National Museum for 1896. It consists of a monograph on the origin of cards and chess, illustrated with several hundred figures and plates.

Upon the invitation of Dr. Franz Boas, in charge of the Section of Ethnology and Archæology, the Museum exhibited a series of objects at the Fourth Annual Exhibition of the New York Academy of Sciences, held at the American Museum of Natural History on April 5th and 6th. The specimens, displayed under the title of "Divinatory Diagrams," comprised divinatory diagrams, and boards and diagrams used in the "Game of the Goose" from Thibet, Korea, China, Japan, Italy, France, Germany, Holland, Sweden, Denmark, and modern and ancient Mexico. The object of the exhibit, which represented recent collections made by Mr. Culin, was to illustrate the parallels, approaching identity, between the pictured diagrams, identified as divinatory and calendrical, and the similar diagrams used in the "Game of the Goose."

The Tennessee Centennial Exposition has invited the Museum to contribute to its Æronautical Exhibit, for which a special building has been constructed, in which plans, drawings, photographs, and models of kites, flying machines, air-crafts, and publications on the same, as well as actual working apparatus, will be shown. The Museum will, accordingly, send to the Exhibition the Malay kites from Johore, for which a special request has been made, together with specimens of Korean and other Oriental kites.

Musical Instruments.—The collection of musical instruments of Mrs. William Frishmuth, of Philadelphia, to be deposited in the Museum, now numbers over five hundred specimens from all parts of the world. Mrs. Frishmuth is having the entire series photographed, with a view of the publication of an illustrated catalogue.

Mr. Sigmund Beel, of San Francisco, has presented a set of six Chinese instruments (19,413 to 19,418), ordinarily used by a Chinese orchestra. It comprises a three-stringed guitar, a moon-shaped guitar, a two-stringed fiddle, a flute, a clarionet, and a gong.

Numismatics.—Baron Wolff, of Schwanenburg, Riga, Russia, has presented, through Mrs. Zelia Nuttall, the following silver coins of the Grand Masters of the "Livland Order" (a branch of the "Teutonic Order"), which were ploughed up in one of the fields on his estate at Alt-Schwanenburg, near Riga, in 1894: 19,485 and 19,486, Henricus of Galen, from Riga, 1554, "ferding"; from Reval, 1555, "schilling"; 19,487 and 19,488, Gotfried Kettler, from Reval, two coins, "artigs"; 19,489 and 19,490, William, Markgrave of Brandenburg, from Riga, two coins, "artigs"; 19,491, Wolter of Plettenberg, from Riga, 1532, "artig"; 19,492, Herman III of Wesel, from Dorpat, "schilling."

The formation of a numismatic cabinet has been undertaken by the Museum, and an exhibition will be made of its collection in the American Hall during the present college term.

LIBRARY.

The Library of the Museum at present comprises 2,214 pamphlets and unbound volumes, and 214 bound books, the greater part of which has been acquired during the past six months. Among the more important acquisitions are the following:

Antigüedades Mexicanas. Publicadas por la Junta Colombina de Mexico en el cuarto centenario del descubrimento de America. Mexico. 1892.

Gift of *Señor Don Joaquin Baranda, Minister of Public Instruction.*

Nombres Geograficos de Mexico. Dr. Antonio Peñafiel. Mexico. 1885.

Fac simile Reproduction of the Vatican Codex No. 3,773.

Gift of the *Duc de Loubat.*

Kultur und Industrie Suedamerikanischer Voelker. Max Uhle. Berlin. 1889.

Gift of *Dr. William Pepper.*

On the Development and Distribution of Primitive Locks and Keys. London. 1881.

Excavations at Mount Caburn Camp. Westminster. 1881.

Excavations in Bokerly and Wansdyke, Dorset and Wilts. Vol. III, 1882.

Report on Excavations in the Pen Pits, near Penselwood, Somerset, London. 1881.

Excavations in Cranborn Chase, near Rushmore. 2 vols. 1887, 1888.

King John's House. Tollard Royal, Wilts. 1890.

By Lieut.-Gen. Pitt-Rivers. Gifts of the author through *Henry C. Mercer, Esq.*

Antiquities of Siberia. 3 vols. 1888 to 1894. 4to.
" " Southern Russia. 7 vols. 1891 to 1896. 4to.
" " Northeastern Russia. 3 vols. 1890 to 1893. 4to.
" " Trans-Caucasus. 1894. 4to.
" " Scythia. 4 vols. 1866 to 1873. 4to and Atlas. Folio.

Archæology of Caucasus. 4 vols. 1888 to 1894. 4to.

Byzantine Monuments in Kertch. 1892. 4to.

Excavations in the Country of the Drevlians (Primitive Russia). 1893. 4to.

Tumuli south of Lake Ladoga. 1895. 4to.

Compte-rendus of the Imperial Russian Archæological Commission. 5 vols. 1886 to 1892. 4to.

Transactions of the Imperial Archæological Congress. 10 vols. 1869 to 1896. Folios and 4tos.

Gifts of the *Imperial Russian Archæological Commission.*

Oriental Antiquities. 2 vols. 1889 to 1896. 4to.

Slavonic Antiquities. 1895. 4to.

Transactions of the Imperial Moscow Archæological Society. 16 vols. 1875 to 1896. 4to.

Gifts of the *Society.*

Archæological Map of the Government of Kiew. V. B. Antonovitch. 1895.

Gift of the *Author.*

Collection of Antiquities belonging to Count A. S. Uvaroff. 3 vols. 1887. 4to.

Study of the Meriens. A. S. Uvaroff. 1875. 8vo.

Gift of *Countess Paula Uvaroff.*

In addition to its own books, the Museum enjoys the use of the valuable library of the Numismatic and Antiquarian Society of Philadelphia, deposited in care of Mr. Culin, its Recording Secretary. This collection is extremely rich in works on numismatics, and transactions and reports of foreign scientific societies.

EXCHANGES.

A regular exchange of publications is now made by the Museum with the following societies and institutions:

Bureau of American Ethnology, Washington, D. C.

Field Columbian Museum, Chicago.

Milwaukee Public Museum.

Numismatic and Antiquarian Society of Philadelphia.

Peabody Museum of American Archæology and Ethnology, Cambridge, Mass.

Smithsonian Institution, Washington, D. C.

United States National Museum, Washington, D. C.

Museo Nacional de Costa Rica, San José, Costa Rica.

Deutsche Gesellschaft fuer Natur und Vœlkerkunde Ost-Asiens, Tokio, Japan.

Royal Geographical Society of Australia, Sidney, N. S. W.

Institut Archéologique Liègeois, Liège, Belgium.

Gesellschaft fuer Lothringische Geschichte und Alterthumskunde, Metz, Germany.

Rijks Ethnographisch Museum, Leiden, Holland.

Real Accademia di Archæologia, Lettere e Belle Arti, Napoli, Italy.

Finnische Alterthums-Gesellschaft, Helsingfors, Finland.

Société Finno-Ougrienne, Helsingfors, Finland.

Société de Geographie de Finlande, Helsingfors, Finland.

Société du Chronique Nestor, Imperial University of Kiew, Kiew, Russia.

Minussinsk Museum, Minussinsk, Siberia.

Moscow Archæological Society, Moscow, Russia.

Museum der Alterthuemer, Odessa, Russia.

Gesellschaft fuer Geschichte und Alterthumskunde der Ostsee-Provinzen Russlands, Riga, Russia.

Wissenschaftliche Commission des Lettischen Vereins, Riga, Russia.

Imperial Archæological Commission, St. Petersburg, Russia.

Imperial Ottoman Museum, Constantinople, Turkey.

An increased list of exchanges with scientific institutions, both in the United States and abroad, is desired, for which purpose copies of the following publications are available:

Annual Report of the Curator, 1890.

Report of the Board of Managers, 1893.

Sommerville Talismans (catalogue), 1889.

Loan Exhibition (catalogue), 1892.

Addresses Delivered at the Opening Ceremonies, 1892.

Old Babylonian Inscriptions, Part I, 1896.

Old Babylonian Inscriptions, Part II, 1896.

On certain Symbols used in the Decoration of some Potsherds from Daphne and Naucratis, 1892.

An Ancient Egyptian Rite, 1893.

The Feather and the Wing in Early Mythology, 1894.

The Exhibit of the Section of Egypt and the Mediterranean, Atlanta Exposition, 1895.

Some Sculptures from Koptos in Philadelphia, 1896.

On the Remains of the Foreigners Discovered in Egypt, 1896.

Chinese Games with Dice, 1889.

Korean Games, 1896.

PHOTOGRAPHS.

The supervision of the photographic work of the Museum has been voluntarily undertaken by Mr. George E. Starr, of Philadelphia, who has made sixty-five 6x8 negatives, chiefly of the new Etruscan collection, since assuming charge. Considerable progress has been made in the formation of a collection of archæological and ethnological photographs, negatives and lantern slides. The principal acquisitions have been:

Sixteen photographs of Letts from Livland. Gift of Mr. Novicky through Mrs. Zelia Nuttall.

Ten photographs (19,682) of scenes and views, characterizing the life of the Kirghiz of the Government of Akmolinsk and Semirechensk, Turkistan, Central Asia. Gift of Konst. Wasil. Nicolayeffsky, Government Omsk, Russia, through Mrs. Zelia Nuttall.

Twenty-six photographs (19,655 to 19,679) representing the manners and customs of the Kirghiz, mosques and schools in Samarkand. Purchased at the Pan-Russian Industrial and Art Exhibition at Nijni-Novgorod by Mrs. Zelia Nuttall.

Four photographs (19,801 to 19,804) of Terraba and Boruca Indians of Costa Rica. Gift of Dr. Thomas M. Calnek, San José, Costa Rica.

Fifty-three lantern slides of types of mankind, made for the Museum from photographs from life to illustrate Prof. E. D. Cope's lecture on "The Physiognomy of Man."

LECTURES.

The following lectures, to which members of the University Archæological Association and their friends have been invited, have been delivered in Horticultural Hall:

1896, December 4th. "Korea, The Chosen Land." Col. Ch. Chaillé-Long.

1897, January 15th. "Japanese Archæology." Prof. Edward S. Morse, of Salem, Mass.

1897, February 15th. "The Physiognomy of Man." Prof. Edward D. Cope.

1897, March 20th. "Ancient Italy in the Light of Recent Excavations." Prof. Arthur L. Frothingham, Jr., of Princeton University.

UNIVERSITY ARCHÆOLOGICAL ASSOCIATION.

President, DR. WILLIAM PEPPER.
Secretary, MRS. CORNELIUS STEVENSON.
Treasurer, JOHN SPARHAWK.

This Association was founded in 1889 to co-operate with the Musuem, which has been largely created by its efforts. It elects from its membership the Board of Managers of the Department of Archæology and Palæontology, with the exception of ten, appointed by the Board of Trustees of the University of Pennsylvania.

Its object is to secure funds for exploration, and to promote interest in the development of the Museum. Its members receive copies of this bulletin, and cards of invitation for all lectures given under the auspices of the Department of Archæology and Palæontology.

The annual membership fee is five dollars, payable in January. Its funds are administered with strict reference to the purpose of the subscription.

For admission to membership, and all other information, application should be made to the Secretary, Mrs. Cornelius Stevenson, 237 South Twenty-first Street, Philadelphia.

FREE MUSEUM
OF
SCIENCE AND ART,

Department of Archaeology and Paleontology,

UNIVERSITY OF PENNSYLVANIA.

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1897.

THE object of this Bulletin is the publication of new material acquired by the Museum of Science and Art of the University of Pennsylvania with accounts of explorations conducted by the Museum and original investigations based upon its collections. The subscription price is One Dollar per year (four numbers).

Communications should be addressed to

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No. 2. PHILADELPHIA, DECEMBER, 1897 VOL. I.

A MODERN KIPU FROM CUTUSUMA, BOLIVIA.

BY DR. MAX UHLE.

At the time I was making preparations for my travels in South America, I came across a passage in the works of the distinguished traveler, J. J. von Tschudi, in which he remarks that the kipu, that famous instrument which held so important a position in the days of the ancient civilizations of Peru, was still to be found in use among the Indians of Northern Bolivia and Southern Peru. It is to be regretted that so expert a traveler did not bring any of these modern kipus back to Europe. So many objects, remains of the civilization of the ancient Indians, have vanished since the time of the travels of Tschudi, that I had reason to fear that the use of the kipu might also have terminated. Fortunately, I found this was not the case. The kipu, indeed, survives in the interior of Peru and Bolivia, and this is not to be wondered at; where the Indians have not been taught reading and writing, an instrument for counting, that had proved so useful that an entire high civilization, that of the Incas, was based upon it, was not to be readily given up.

Being aware of the importance of this instrument as a medium of civilization, I missed no opportunity in Northern

Bolivia of asking the people, Spanish as well as Indian, if they had any knowledge of the use of curious knotted strings for purposes of counting. Not discouraged by many negative replies, I succeeded at last in obtaining two modern representatives of the ancient kipus, the first at Challa, on the Island of Titicaca, which I sent directly to Professor Bastian, at Berlin, who esteemed it so highly that he was kind enough to publish an account of it, together with my notes, almost immediately (*Ethnologisches Notizblatt*, 1895, *Heft* 2, page 80, with plate III), and the second at Cutusuma[1], on the southeastern shore of the Lake of Titicaca, not far from the road leading from Chililaya to Aigachi, about two leagues from the former village and about one league and a half from the latter.

The second of these kipus, which I handed to the Department of Archæology of the University of Pennsylvania, is the one which I intend making the special subject of the following pages, in which I shall at the same time present some further notes on the subject of the modern and ancient kipus. I propose, in this paper, to clear the question of the ancient kipus as far as is possible, principally for the purpose of opening a somewhat broader field for future inquiries.

I obtained my second kipu from a common Indian, during an excursion in April, 1895, together with the friendly corregidor of the village of Aigachi, to the other side of the hills separating the plain of Aigachi from a more eastern plain that stretches from the Lake of Titicaca far toward the south to the so-called "Alto de La Paz." Cutusuma is a small hacienda in that plain, distant only a few minutes from the shores of the lake. The Indian who gave me the kipu had been alcalde (a kind of officer among the Indians) during the year 1894. As alcalde he had been responsible for keeping in order the flocks of the farm, and at the end of the year of his office he was obliged to deliver to another Indian who succeeded him as alcalde, among other things, the command of all the sheep and shepherds of the farm. This was done in accordance with the

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[1] Manuel V. Ballivian, *Diccionario Geográfico de la República de Bolivia*, 1890, I p. 35.

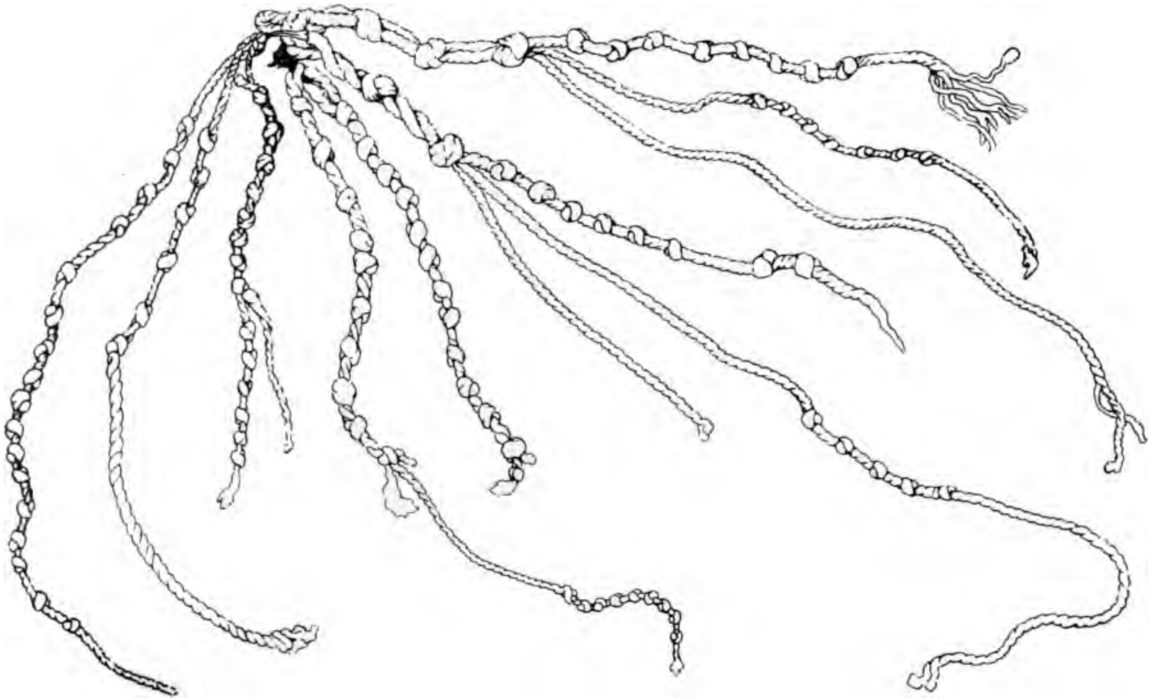

Plate 1. Kipu from Cutusuma, Bolivia. Museum of Science and Art, University of Pennsylvania, 36,392.

numbers indicated by the kipu that he then held, and which he retained when we visited him. It is improbable that I should have succeeded in securing this interesting specimen, had it not been for the intervention of the corregidor, the authority of the village to which Cutusuma belonged. In a similar manner I obtained the first of my kipus at Challa, through the kind assistance of Sr. Machicado, the administrator of the farm. During my travels on the shores of the Lake of Titicaca I was promised several others, which, however, I did not receive. The wife of the sub-prefect of the province of Omasuyu, when I showed her the first I obtained, told me of more specialized forms that served for keeping harvest accounts on farms, and promised to procure me one. But she failed to obtain it. The tenant of the hacienda of Chinchaya, which lies between Achacache and Ancoraimes in Omasuyu, was aware that one of his Indians preserved a kipu. The Indian, on being questioned, did not deny the fact, but, instead of delivering it for the money which we offered, returned later with the news that the rats had eaten it. Of course, this was an absurd excuse, but as the Indian was not willing to give up the kipu, it was impossible to force him. All of which goes to show that a traveler depends much upon the good-will of the Indians, and that many things are not obtained by a white man and a traveler simply because he is a white man and a foreigner. As such he is unable to surmount the instinctive distrust and mental opposition the Indian has for him.

The kipu of Cutusuma, Plate I, is not colored. It consists of white strings of sheep wool. Four divisions of strings are to be distinguished and in each of these, threads of different thicknesses and knots of different sizes are found together. There are strings of two threads, others, also, of four or six threads, and some formed by twisting together two parallel strings of the latter kind. By making knots in the strings of different thicknesses the knots become of different sizes, and so we find knots of three different kinds.

The system of reading or interpreting the kipu, is as follows :

Each division of strings represents a different kind of animals (the flocks of the farms are always of four kinds, consisting of ordinary female sheep, rams, lambs, and milking sheep).

"The number of female animals is always indicated on the border of the kipu, and that of the males in the centre" (information given by the Indian).

The three kinds of knots express respectively, according to their size, hundreds, tens, and units.

With these facts in mind, we may proceed to read the kipu.

The alcalde of Cutusuma delivered at the close of the year 1894 to his successors:

387 sheep

285 rams

121+99 lambs. These are the lambs of the second and third set of the year, the lambs of the first set having been joined as is the custom to the rams of the same year.

86+60+170 milking sheep (of the three sets of lambs for the year).

My two modern kipus answer the description of the ancient kipus as given by Inca Garcilaso.

These and others of which I heard were used, like a large part of the ancient ones, for the purpose of counting the harvest and other agricultural productions [1], and served especially for making annual accounts.[2]

The distinction of different kinds of knots, expressing by their size, hundreds, tens, and units, and arranged in series so that the knots expressing the highest numbers are found uppermost, accords with what Garcilaso tells us of the ancient kipus[3].

A main string, to which the strings of the knots were attached, as Garcilaso describes of the ancient kipus, is also a feature of the tripartite modern kipu from Challa, now in the Berlin Museum.

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[1] Garcilaso de la Vega, *Comentarios Reales*, Pt. I, B. VI., Ch. 8.

[2] Garcilaso l. c.:—porque estas cuentas eran anales, y no daban razon mas que de un año solo.

[3] Garcilaso l. c.: Los nudos se daban por su orden de unidad, decena, centena, millar, decena de millar, y pocas veces ó nunca, pasaban a la centena de millar. . . . Estos numeros contaban por nudos dados en aquellos hilos, cada numero dividido del otro: empero los nudos de cada numero estaban dados todos juntos debajo de una vuelta, a manera de los nudos que se dan en el cordon del bienaventurado Patriarca San Francisco, y podiase hacer bien porque nunca pasaban de nueve como no pasan de nueve las unidades y decenas, etc.

The distinction of the counted objects by the colors of the strings expressive of them, as used in ancient times, is still in use in many places, as on the eastern side of the Lake of Titicaca, where yellow stands for barley and so forth. The memory of it also was still kept alive on the Island of Titicaca, although it had fallen into disuse there on account of lack of colored string among the Indians.

The objects on the uncolored ancient kipus were arranged according to their values,[1] and the same applies to the modern ones.

The most conclusive evidence that the modern kipus are the direct descendants of the ancient ones lies in a significant peculiarity common to both. Garcilaso tells us that there were, in addition, certain strings attached to the main strings, which served no other purpose than to indicate certain exceptional numbers disturbing the final total of the main strings.[2] On the kipu from Challa (now in the Museum of Berlin) two separate strings attached to the main ones indicate the number of rams consumed in the kitchen of the owner of the hacienda on the one, and the other the number of sheep eaten by the shepherd himself. Both numbers are to be subtracted from the respective totals to which they are subordinate. The modern kipu from Challa thus serves to illustrate the detail related by Garcilaso of the ancient kipus, which otherwise, perhaps, would have been unintelligible.

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[1] Garcilaso l. c.: Las cosas que no tenian colores iban puestas por su orden empezando de las de mas calidad, y procediendo hasta las de menos, cada cosa en su genero, como en las miesses y legumbres. Pongamos por comparacion las de España, primero el trigo, luego la cebada, luego el garbanzo, haba, mijo, etc. Y asi tambien cuando daban cuenta de las armas, primero ponian las que tenian por mas nobles, como lanzas, y luego dardos, arcos y flechas, porras y hachas, hondas y las demas armas que tenian, etc.

[2] L. c.: Algunos destos hilos tenian otros hilitos delgados del mismo color como hiuelas, o eccepciones de aquellas reglas generales, como digamos en el hilo de los hombres o mugeres de tal edad, que se entendian ser casados, los hilitos significaban el numero de los viudos, o viudas que de aquella edad habia aquel año. . . .

The general analogy between my two modern kipus and the ancient specimens of our archæological museums[1] seems very clear.

If the description of the ancient kipus in the work of Garcilaso, the modern specimens and the ancient kipus of the museums are in perfect harmony, now that we have obtained the clue for understanding the modern ones, should it not be as easy to explain the ancient as the modern ones?

I venture to remark that the analogy between the existing ancient kipus and Garcilaso's description of them bears a still closer similarity than that between the latter and the modern examples. Garcilaso states that kipus of his time had the length of about a foot and a half. This, I believe, is generally the length of the ancient kipus, but the two modern ones obtained by me are much shorter.[2]

Garcilaso does not speak of different kinds of knots being found on different strings knotted together, but lets us understand that all the different kinds of knots existed on each single string, as is the case with the existing ancient specimens, but not on the modern ones.[1]

---

[1] Some of the latter have already been reproduced in publications usually more for the sake of curiosity than with any intention of explaining them. J. J. v. Tschudi, *Peru, Reiseskizzen*, 1846, II p. 384, represents one of these. The same has been reproduced in Rivero y de Tschudi, *Antiguedades peruanas*, 1851, p. 106. Another, in the Museum of Berlin, was published in the *Archiv für Post und Telegraphie*, Berlin, Erg.-Heft, Sept. 1888, and this last gives us, up to the present time, the best idea of an ancient kipu. A drawing from this picture, evidently made without due appreciation of the significant details, is given by F. Ratzel, *History of Mankind*, translated by Butler, London, 1897, II, 167. The one reproduced in Lord Kingsborough's *Antiquities of Mexico*, 1832, vol. IV, seems to be apochryphal, especially when we consider that the wooden box in which it was long preserved is not, as related, of pre-Spanish, but of later origin. A picture of the same kipu, taken from a work of Perez, was also reproduced by Andree in his article on knotted strings, *Ethnograph. Parallelen*, as well as in the Tenth Annual Report of the Bureau of Ethnology, 1888-89, Pl. XVI. The statement that this kipu was excavated and immediately drawn, is paralleled by so many similar statements on the part of owners of modern and forged objects that we are justified in forming our own conclusions. The method of its preservation, as described by Lord Kingsborough, favors rather than opposes its posthumous origin. The kipu represented by Mon. de Nadaillac in his work, *L'Amérique Préhistorique*, p. 459, cannot be brought into accordance with Garcilaso's description of the ancient kipus, and must, therefore, be likewise considered as doubtful.

[2] That of Challa has a length of about half a foot, that from Cutusuma is a little longer (about one foot in length).

And, lastly, he makes mention of the knots being so well arranged on the strings that the knots of the same kind or equal denominations corresponded in their height with each other on the different strings, "as a good accountant brings his figures under each other to make the total at the present day"[2].

This feature has evidently been lost in the modern kipus. We find on them no intentional parallelism of similar kinds of knots on the different strings. But on looking at the ancient kipu of the Berlin Museum, as reproduced in the *Archiv für Post und Telegraphie,* we recollect Garcilaso's nice description of the proper order of knots on the strings.

On the modern kipus the value of the different kinds of knots is shown by their different sizes, while on the ancient kipus this is indicated by the various heights of their position on the strings. If we look at the kipus as reproduced in the *Archiv für Post und Telegraphie,* we see that the knots crowded together in small series on higher portions of the strings represent a higher decimal system of figures than those at the lower end. The latter are of a different shape. They are formed by a number of spiral twists of the string, and are held together by the ends of the string passing through them in either way. Their general appearance is shown in Fig. II.

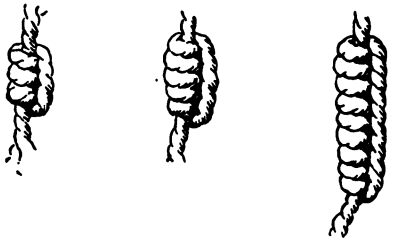

Fig. II. Knots in Kipus.

There is no doubt that they represent the smallest numbers in the decimal system of counting. Each special turn of the string apparently signifies a unit, and, although the number of the spiral twists varies greatly on the last knots of every string, the number of turns is, I believe, never more than nine. Mr. Frank H. Cushing observed the general resemblance that they bear to the hand, so frequently used for counting purposes, when closed, and I do not hesitate to refer to this comparison as an interesting idea.

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[1] Though Cieza was perhaps acquainted with kipus of a similar ramification of the strings as the modern one from Cutusuma, Crónica, II p. 41: y en estos nudos contaban de una hasta diez, y de diez hasta ciento, y de ciento hasta mill y en uno destos ramales está la cuenta del uno, y en otro la del otro.

[2] Los nudos de cada numero y de cada hilo, iban parejos unos con otros, ni mas ni menos que los pone un buen contador para hacer una suma grande.

But when we have arrived at a satisfactory understanding of the number as counted on the knots, we have not yet reached a complete comprehension of the kipus. Many of the ancient kipus were of the same kind as the kipu from Cutusuma, which, though readable enough as far as the arithmetical part was concerned, still required some information—perhaps a single word would have sufficed—to indicate the kind of objects to which it belonged. Without this it will be hopeless to arrive at a full understanding of them.

On the other hand, there were many kipus legible to everybody because their colors indicated the kind of objects to which they referred. We are told that in the empire of the Incas a class of learned men understood by help of the colors the interpretation of the kipus, as we understand the contents of books in the present day.[1] Many of the ancient kipus in the museums are colored. It must be admitted that we could understand their contents if we possessed a broader knowledge of the rules relating to the meanings of the colors. The acquisition of this must be our aim in the future.

The discovery of the color values in ancient times is to be obtained in two ways: first, by a careful study of the oldest works treating of the civilization of the Incas, as it is probable that we shall find passages explaining the value of the colors on the kipus, as for instance, Garcilaso tells us: white stands for silver, yellow for gold, and red for warriors. Professor Bastian has made some important citations[1] from the rare work of Calancha and others in this respect, and in the same manner more will eventually be discovered. Mon. de Nadaillac mentions a kipu used during a revolution of the Indians near Valdivia in Chile, in 1792.[2] This notice, again, assists our knowledge of the significance of the colors, so that we may give the following small table of the value of the colors on the kipus as probably correct:

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[1] Zárate, *Historia del descubrimiento*, 1557, I cap. 5: Assi se hallan las casas publicas llenas de estas cuerdas, las quales con gran facilidad da à entender el que las tiene à cargo, aunque sean de muchas edades, antes de èl.

	Garcilaso	First Citation given by Bastian	Second Citation	Third Citation	Araucanians according to Mon. de Nadaillac
White	Silver	Silver			Time (coming days)
Black			Time		Time (passed nights)
Yellow	Gold	Gold			
Red	Warriors	War			Persons invited to war*
Green				Killed in war	
Blue					Persons invited to war and refusing†
Carmine		The Inca	The Inca		
Brown		The Curaca			
Gray				Provinces	
Variegated		Government			
Twisted of blue, yellow, and white		Religion			

* The Pehuenches signify the amount of the blood-money by kipus and declare by the red color of the strings their resolution to take vengeance immediately, if the price is not paid. Pöppig, *Reisen in Chile* etc. 1835, I, 386.

† There are four threads which are blue on the modern kipu from Challa, two of which, perhaps by chance, are also those that indicate the exception from the main count.

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[1] *Die Culturländer des Alten America*, 1889, III, p. 74:—Aora pues los que viesen este cordon de la mitad par abajo con hilos de tantos colores, nudos y nuditos, y la otra mitad antecedente con solo hilos pagiços y millares de nudos sin colores, dirian: Esta gente que avia antes deste Rey Mancocapac no tenia Rey, pues no ay hilo carmesi, ni tenia señor, ni cabeça que los governase, pues no ay hilo morado, ni tenian policia, pues no hay torçales de diferentes colores, ni tenian guerra, pues no ay hilo colorado, ni se les dava del oro y plata, pues no hay hilo blanco, ni amarillo, ni tenian as (?) culto, adoracion, ni sacrificios, pues no hay torçal de azul, amarillo y blanco, barbaros eran antes que uviese Reyes.—Pondria el Quipucamayoc en esta forma los hilos y los nudos en un

The second way in which we may hope to increase our knowledge of the values formerly set on the colors is by a closer study of the kipus now in use among the Indians.

We may suppose that they are in use throughout a large area in Northern Bolivia and Southern Perú (compare J. J. von Tschudi), Northern Perú and also perhaps in Ecuador.

I was informed by persons acquainted with the interior of Northern Perú, that in the elevated valleys of the mountains the Indian herdsmen make up their accounts by kipus very similar to those of ancient times. In Ecuador the use of kipus was in vogue in many parts of the mountains in the seventeenth century,[1] and it was also observed by the traveler Stevenson at Riobamba in 1823.[2] It is my opinion, that proof that it has since become obsolete is necessary. The use of the colors to indicate the kind of objects to which the kipus belong, survives in many parts of this large area, especially in Northern Bolivia and Northern Perú, as I myself verified. Though it is improbable that by the study of the modern kipus of these regions we shall be able to construct the whole system of the values

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cordon negro, que significava el tiempo, muchos hilos pagiços, y millares de nuditos sin color diferente, y en medio del un gran nudo, y atravesado un hilo de color carmesi finisimo, que este significava el Rey.—Para dezir que sujetó diez provincias, saldria deste nudo otro hilo pardo con diez hilos y en cada uno atado un hilo verde con los millares de Indios que murieron de los contrarios, los principes (?) los de sesenta años arriba.

[2] De Nadaillac, l. c. p. 459: Une grande révolte contre les Espagnols fut organisée en 1792. Elle avait été préparée, ainsi qu' on l' apprit plus tard, par des messagers portant un morceau de bois dans lequel étaient renfermés des fils, dont les extrémités formaient des franges rouges, noires, bleues ou blanches. Le fil noir portait quatre noeuds qui signifiaient que le messager était parti de Valdura, la résidence du chef de la conspiration, quatre jours aprés la pleine lune. Le fil blanc portait dix noeuds, ce qui voulait dire que la révolte éclaterait dix jours après l'arrivée de ce messager. La personne à qui le quipo était remis devait a son tour faire un noeud au fil rouge, s' il acceptait de se joindre aux conjurés, aux fils rouges et bleus, si au contraire il s'y refusait.

Instead of Valdura should be read Valdivia (Chile), because, according to the annals of the Virreys, there was no other rebellion in the year 1792 in Perú, except a rebellion of Araucanians in Valdivia.

[1] *Docum. inéditos de Indias*, IX, 378, 469, 471, 495.

[2] W. B. Stevenson, *Twenty Years' Residence in South America*, 1829, II, 269.

assigned to the colors of the kipus by the ancient Indians—as they had to distinguish a greater variety of objects in their highly-developed civilization[1] than the poor Indians of to-day—no one can safely say that we shall not in time greatly increase our knowledge of the ancient values of the colors by a closer study of the existing kipus.

I do not deny that the explanation of the ancient kipus is one of the most difficult questions in Peruvian archæology and it is uncertain that we are likely to advance rapidly in this direction, but the matter is so important that we are not justified in neglecting the last opportunities of saving all possible knowledge of the ancient kipus, that will have disappeared when the light shed by modern schools shall have in time extinguished the simpler though effective means of ancient civilization.

It would serve to advance the question if museums that possess ancient kipus would publish them. We would then clearly see what details remain to be explained, and further inquiries could be proceeded with accordingly.

THE KABAL, OR POTTER'S WHEEL OF YUCATAN.

BY HENRY C. MERCER.

In studying the pottery of ancient Yucatan, we may infer that the processes of manufacture still in existence among the Maya Indians and half-breeds of the Peninsula have been to a great extent inherited from their ancestors in pre-Columbian times. As opposed to a general impression among archæologists that no true potter's wheel existed in America at the time of the discovery, we observed, while conducting the Corwith Expedition for the University of Pennsylvania, in Yucatan, in 1895, a true, though simple potter's wheel, in operation among native potters at Merida. As described in the report of the expedition (*The Hill Caves of Yucatan*, Lippincott, Philadelphia, 1896, p. 163), the potter's wheel in this instance is of the simplest and most primitive character. It, however, presents the principle of revolving clay molded against the stationary fingers of the worker, as completely as the most finished wheel in existence. At the same time, its peculiar mechanism and mode of operation distinguish it from any similar clay-moulding wheel thus far known to the writer, from any part of the Old World, in ancient or modern times.

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[1] Acosta, *Historia general y moral de las Indias*, 1590, VI cap. 8: Porque para diversos generos como de guerra, de gobierno, de tributos, de cerimonias, de tierras, habia diversos quipos o ramales. Y en cada manojo destos tantos nudos, y nudicos, y hilillos atados: unos colorados: otros verdes: otros azules: otros blancos: y finalmente tantas diferencias que asi como nosotros de veinte y cuatro letras guisandolas en diferentes maneras sacamos tanta infinidad de vocablos, asi estos de sus nudos, y colores sacaban inumerables significaciones de cosas.

At Merida the woman potter sat upon a very low stool, called in Maya, *Kanche*. Before her was placed a soaped board, upon the surface of which she caused to revolve with her bare feet, the *Kabal*, or potter's wheel, a cylindrical section of a billet of wood perfectly round, about three and one-half inches high, and about four inches in diameter. On the flat top of this stuck a ball of clay, which, as it turned, took shape against her down-pressing fingers, as in the case of the formation of earthenware by all modern civilized potters. A wooden splint sharpened to a knife-edge (*Cuchilla cheh*), a small convex section of the rind of the calabash (*Box*), and a piece of soaked leather (*Keuel*) did the shaping. There were other interesting features of the process: the polishing with the pebble (*Yulu*), the painting, either with native red paint clay (*Kan cab*) or an imported powder, the imported glaze, the preparation of the raw material, the soap, the burning, etc. But for archæologists, the chief feature of interest is the *Kabal* itself. Did or did not the singular invention exist in pre-Columbian America?

If we must derive it from the Spaniards we might expect to hear something of it in old Spain, or among the Moors, which we have thus far failed to do. Some of the minor objects used in the process, evidently the result of Spanish contact, have Spanish names, which causes us to wonder why so valuable a device as the wheel, if similiarily presented to the Indians by

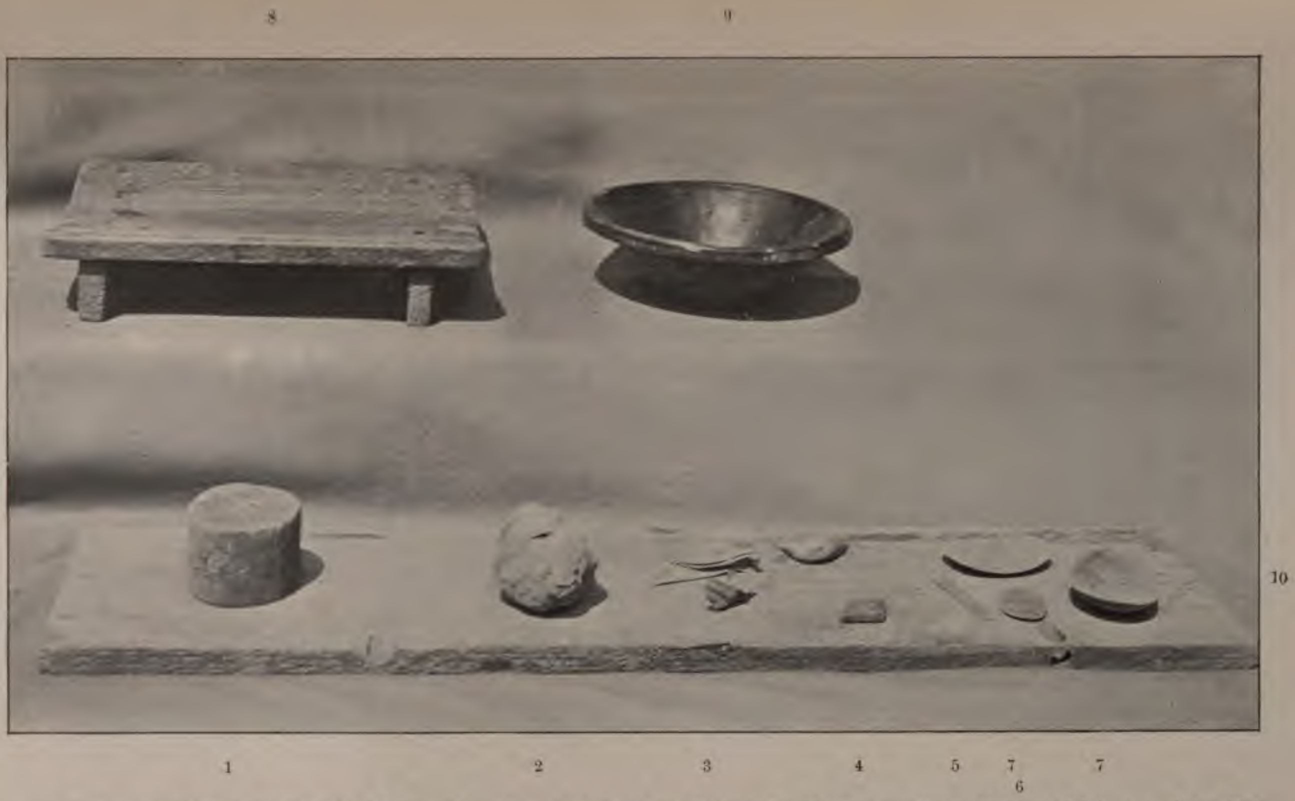

Plate 2.—Appliances of Native Maya Potter, collected by the Corwith expedition at Merida, Yucatan, 1895. Museum of Science and Art, University of Pennsylvania. 13,976–86. 1, *Kabal*, potter's wheel. 2, *Kat*, ball of alloyed clay. 3, *Keuel*, leather smoother. 4, *Jabon*, soap. 5, *Cuchilla chch*, splint knife. 6, *Yulu*, pebble polisher. 7, *Box*, calabash rounding tools. 8, *Kanche*, potter's stool. 9, *Lebrillo*, water dish. 10, *Limia*, work table on which the *kabal* revolves.

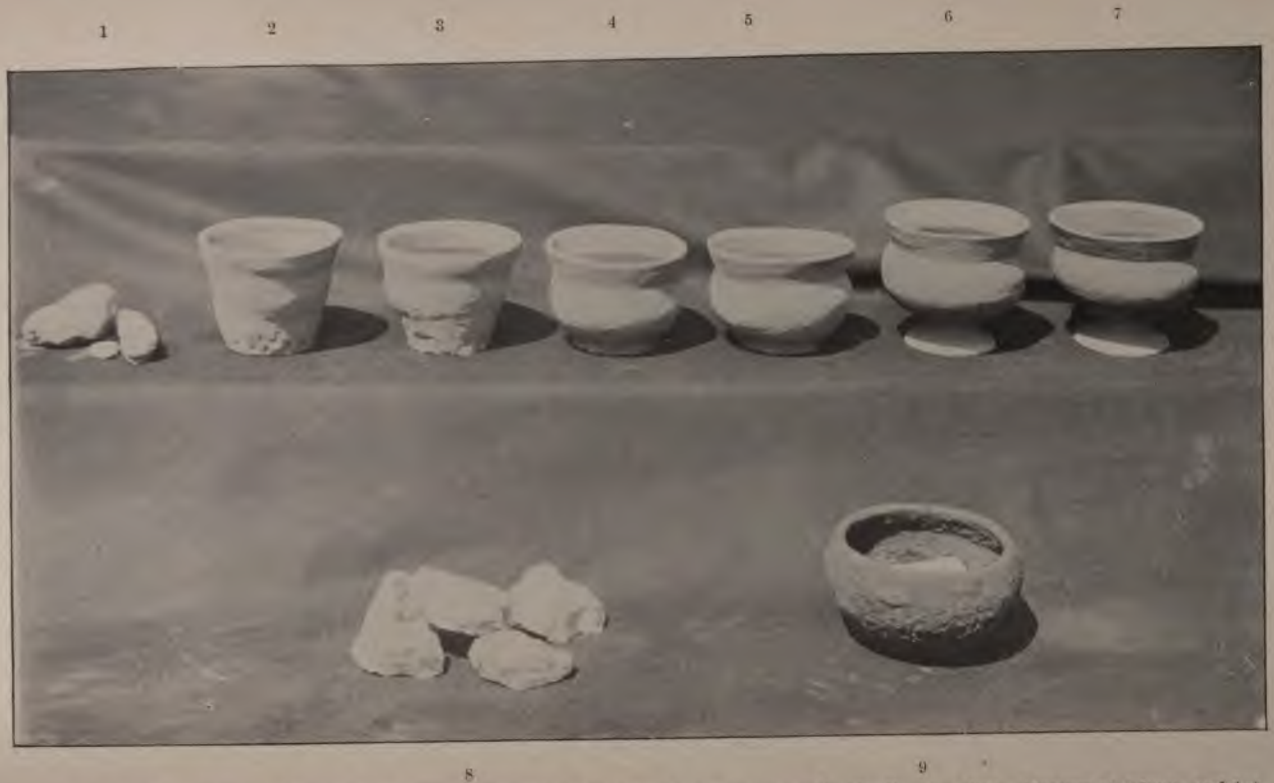

Plate 3.—Manufactures of Native Maya Potter, collected by the Corwith expedition at Merida, Yucatan, 1895. Museum of Science and Art, University of Pennsylvania. 13,987-97. 1, Lumps of *saccat*, native clay. 2-7, Unbaked clay forms freshly turned on the *kabal*, illustrating process of making bowl, No. 7, which is air dried and pebble polished. 8, Lumps of ground limestone for mixing as an alloy with the native clay. 9, Bowl containing *kan cab* or red clay paint for coloring the bowls before they were burnt.

their Spanish conquerors, escaped a Spanish name. The word *Kabal,* however, is Maya, though strange to say it does not occur in the earliest dictionary of the language published at the monastery at Motul, in 1576. Because it appears first in the later dictionary of the Convent of San Francisco at Merida of about 1690, Dr. Brinton proposes to date the word and the wheel after Spanish conquest. But the absence of the word in the older dictionary fails to weigh conclusively against the antiquity of the device. In several letters received from Yucatan after this question had been raised, I have been assured of the opinion of the late Bishop, of Captain Theobert Maler of Ticul, and lastly of Don Juan F. Molina Solis, author of the *Historia Del Descrubimento é Conquista de Yucatan* (Merida, 1896), to the effect that the Kabal is a device indigenous to ancient Yucatan. The latter writes from Merida on the 26th of last month, as follows:

"I have received your kind letter of the 28th of June, and the article on the 'Kabal' that you published in the number of June 11th of the review *Science.* I have read it with great interest, and am completely on your side in the discussion, because I think that the 'Kabal' was not introduced into the country from Europe, but that it was a primitive invention of the Mayas. This is the universal opinion in this country. No one here thinks that this utensil was brought over by the Spaniards as an improvement in the potter's art. The Spaniards and their descendants never were occupied in manufacturing pottery. The art always has been in the hands of the Mayan Indians until the present time. The fact that the word 'Kabal' is not in the primitive dictionaries is no reason against our opinion, because they are deficient and lack many words.

"Yours truly,

"JUAN F. MOLINA SOLIS."

For these reasons I objected in *Science* (June 11th, 1897) to Brinton's statement therein (May 21st, 1897), that "the device of the potter's wheel was anciently unknown in either North or South America," and his failure to mention the Kabal, together with the other potter's appurtenances (herewith shown), as illustrating its use, in the possession of the Museum of Science and Art of the University of Pennsylvania for the past two years. The evidence thus far is not conclusive that the peculiar device will ever be discovered in the Old World, neither does it fully demonstrate the existence of the Kabal in pre-Columbian America, but it presents archæologists with a fact that cannot be overlooked.

NOTE ON THE CLASSICAL MURMEX.

In the first number of the *Bulletin* I had an article on "The so-called Bow-puller Identified as the Greek μυρμηξ."

The identification which I there announced of the curious bronze object referred to in most catalogues as a "bow-puller" or "bow-stretcher," with the *murmex*, fastened by pugilists to the cæstus so as to render the blow more formidable, has received general acceptance; but some objections have been urged against it by high authorities, which I take this opportunity to consider.

Professor E. S. Morse, whose article first called attention to this implement, advances in a letter two objections to my identification; first, that so many of the specimens have blunt or short points; and secondly, that the extremities of the base of nearly all of them bend slightly upward, so as to present a faintly concave surface beneath.

To these I would reply that some of them were intended to be much more lethal than others, and therefore in such the points were made long and sharp, while a less destructive variety had merely a blunt projection instead of a sharp point; and as to the slightly concave outline of the base, an experiment promptly demonstrates that this is a great advantage in strapping them on a somewhat yielding surface, such as the leathern cæstus, as the leverage presented by the elevated ends of the base allows the body of the instrument to be pressed more firmly downward.

Another and obvious objection was urged by Sir John Evans in a letter to me on the subject. His words are: "If these objects had been really μυρμηκες, I think that we should have found them represented on ancient statues," no instance of which could he remember.

This weakness of my case had always been present to me, and therefore, when in Paris in September, I went carefully through the museums of the Louvre, to see if I could discover any examples among the ancient marbles. My labor was rewarded in the most satisfactory manner by finding an admirable representation of the wearing of the *murmex*. It is a full-length figure in marble, No. 68, in the Salle des Caryatides, and bears the legend, "Athlète Vainqueur au Pugilat." He is fresh from his victory, naked, each hand covered with a cæstus, *and upon each a murmex*, separate from the cæstus, and as perfectly defined as the implement could be in the stone. One has three sharp points almost equal in length, the other has one prominent central point, while those on either side are blunt. The statue is labelled of ancient Greek work found at Rome. The arms are faithful copies of those in Rome.

This discovery removes all doubt of the correctness of my identification. D. G. BRINTON.

COLLECTIONS AND PUBLICATIONS.

AMERICA.

ALASKA.

Mr. Edward L. Griffith, of San Francisco, has presented, through Mr. J. A. McIlhenny, the following objects from Alaska:

Occipital portions of skull with attached horn cores of

Ovibos moschatus, Zimm. ♂ (13,751).
Bison antiquus, Leidy ♂ (13,752).
Bison antiquus, Leidy ♂ (13,753).
Bison ———— Sp. Nov. ♂ (13,754).

Section of tusk of *Elephas primigenius*, cut by natives (13,755), together with molar teeth (2), pelvic arches (2), femur, right ulna, tibia, and fibula (13,756-61) of the same species.

All of the above are from the tundra back of Point Barrow, Alaska.

The fossil bison skulls have been kindly identified by Mr. Samuel N. Rhoads, who will publish an illustrated account of them in the Proceedings of the Academy of Natural Sciences of Philadelphia for December, 1897.

UNITED STATES.

Alabama.—Five fossil shark's teeth (13,555) from Montgomery County, and a finely wrought polishing muller[1] (13,662), of quartz from vein, from Tuscaloosa County, have been presented by Mrs. W. H. Miller.

Florida.—The "Preliminary Report on the Exploration of ancient Key-dweller remains on the Gulf Coast of Florida," by Mr. Cushing, separately printed from the Proceedings of the

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[1] Schoolcraft, Vol. 4, p. 163.

American Philosophical Society (Vol. XXXV, No. 153) pp. 120, 11 plates, is ready for distribution and can be obtained by application to the Museum.

Maryland.—A large grooved stone axe (13,620) and six knives (13,535) of jasper and quartz, have been presented by Mrs. W. H. Miller.

Massachusetts.—Mrs. W. H. Miller has presented the following objects: A single broad hollow-bitted steatite smoothing adze with sharply grooved butt, for hafting transversely, inscribed "Found by W. Spooner, 1826, in the town brook, Plymouth, From Ammie Brown, Salem, Mass.;" two gouges (13,658–59), six chipped blades (13,661) "presented by Ammie Brown to Jacob G. Morris," and a grooved adze (13,668) from West Bridgewater.

Mississippi.—A paint cup (13,624); two minute celts (13,627–28); two grooved sinkers (13,629–30); nine flint knives (13,632–40); flint drill (13,641); sandstone blade (13,642), and an amulet concretion (13,631) of jasper, exhibiting artificial extension of spiral and curved lines, from Natchez, have been presented by Mrs. W. H. Miller. No. 13,624 is designated as from a mound near Natchez, which is also the probable source of the other specimens. Nos. 13,624 and 13,627 are labelled "from W. S. Vaux, Esq."

New Jersey.—An argilite adze-celt, showing hafting mark over outer face and rudimentary grooves at sides, "ploughed up near Trenton, 1837" (Dr. S. G. Morton); two large leaf-shaped jasper blades (13,520, 13,613), one labelled from W. S. Vaux; eight blades from Belvedere (Jacob G. Morris), and five blades (presented by Miss Lloyd to J. G. Morris) have been given by Mrs. W. H. Miller.

New Mexico.—Mr. F. Webb Hodge, of Washington, D. C., has presented a kicked stick (19,971) for the Zuñi racing game, used in foot race from Ojo Caliente summer village to Zuñi (about fifteen miles), September 11th, 1888; forty plume or prayer sticks (19,972–20,009), and six sacrificial sticks (20,010–15) from various Zuñi shrines.

New York.—A narrow white flint knife (13,644), 5¾ inches in length, from near Lake George; a flint reaming knife

(13,650), 5⅝ inches in length, from West Chester, and a war axe blade (13,619), Plate 4, Fig. 2, for side hafting, after manner of corresponding South American and Antillean battle-axes, have been presented by Mrs. W. H. Miller. The last specimen is labelled "From J. Allan, Esq., New York, Nov., 1853." Its provenant is somewhat doubtful.

North Carolina.—A very perfect hematite paint stone (13,245), found on uprooting a tree on Green River Plantation, Polk Co., has been presented by Mr. Tench C. Coxe, of Green River Plantation, through Dr. B. B. Reath, of Philadelphia; and a large, double-grooved truncate butted axe (13,621), from the bank of the Swananoa River, Buncome Co. (Dr. Hardy), from the collection of Dr. Samuel G. Morton, has been presented by Mrs. W. H. Miller.

Ohio.—Two mullers (13,646, 13,655) and a stone ball (13,647), all marked W. S. Vaux, have been presented by Mrs. W. H. Miller.

Pennsylvania.—An unperforated banner stone (13,517) from Montrose, Allegheny County; a polished grooved axe (13,617) (William H. Miller) a rude quartz knife (13,546), jasper blade (13,653), rude grooved axe (13,654), Clearfield Farm, and six chipped blades (13,656) from Delaware County, and a polished grooved axe, "C. W. Pennock, Brandwine Farm, 1814," the latter ground at the top in a double curve, have been presented by Mrs. W. H. Miller.

Oregon.—Twelve arrow-heads, four (13,547) from the Columbia River, Umatilla; two (13,549) from The Dalles, and three fore-shafts (13,550) with flint and obsidian points, have been presented by Mrs. W. H. Miller.

Rhode Island.—A grooved beater for flattening bark (13,623) from Narragansett, has been presented by Mrs. W. H. Miller.

South Carolina.—Mrs. W. H. Miller has presented the following objects: Five large grooved axes (13,587–91), a double-bitted battle-axe (13,610), grooved at side, and a ceremonial battle-axe (13,600), Plate 4, Fig. 2, showing marks of hafting sidewise in narrow wooden handle, with the flanges of the blade designed to fit close to hafting, as indicated by the shifting lower

Fig. 1.

Fig. 2.

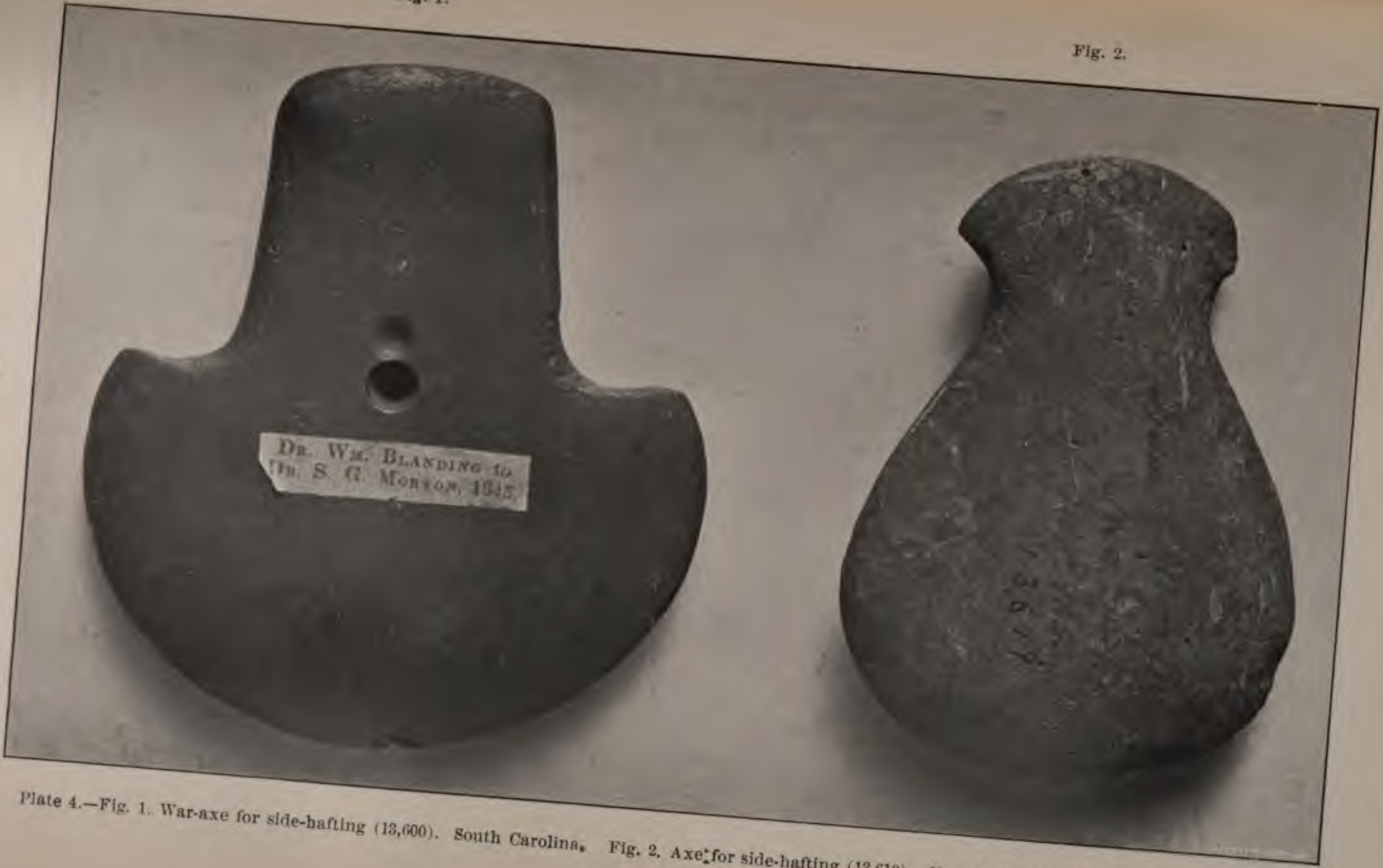

Plate 4.—Fig. 1. War-axe for side-hafting (13,600). South Carolina. Fig. 2. Axe for side-hafting (13,619). New York. ½. Gift of Mrs. W. H. Miller.

Fig. 1. Fig. 2. Fig. 3.

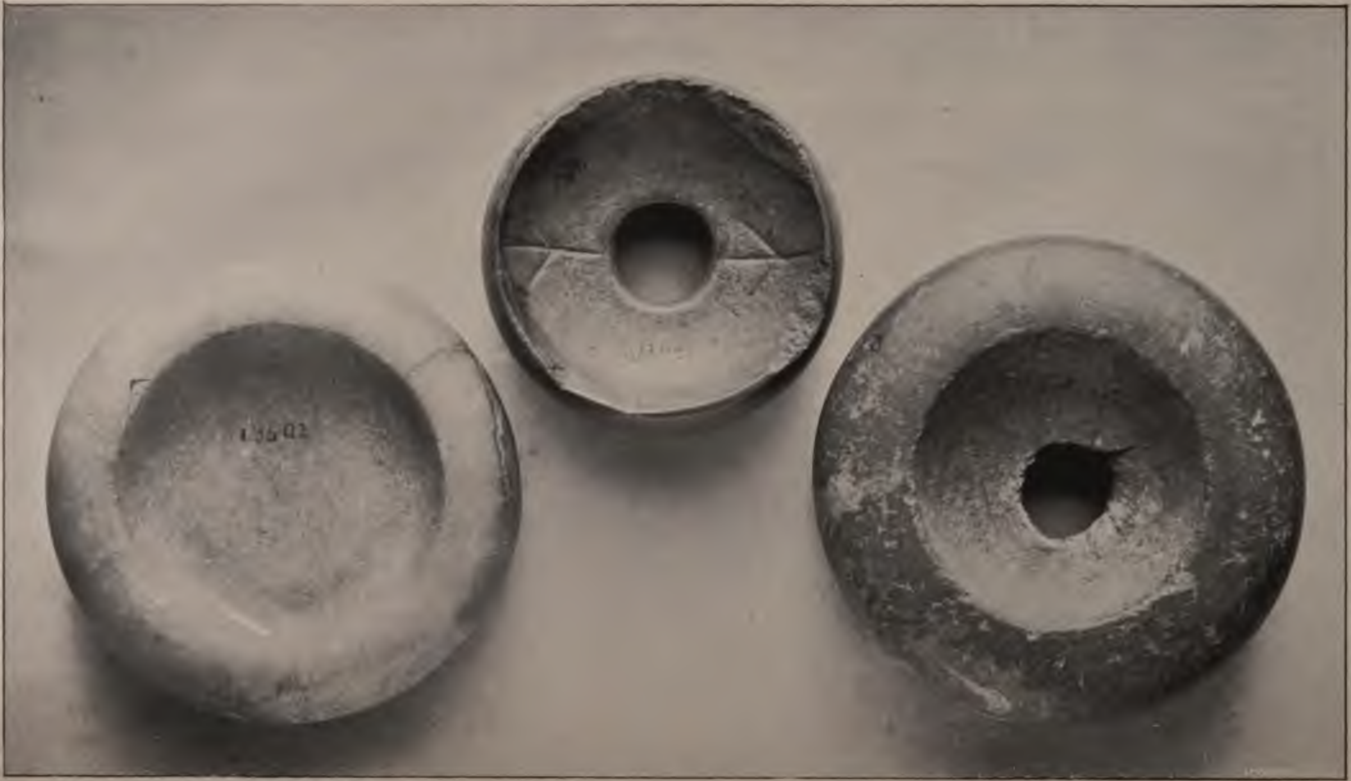

Plate 5.—Fig. 1. Chunkee Stone (13,602). Fig. 2. Chunkee Stone (13,556). Fig. 3. Chunkee Stone (13,603). South Carolina. ½. Formerly in the collection of Dr. Samuel G. Morton. Gift of Mrs. W. H. Miller.

of the point of perforation.[1] Figured by Schoolcraft (Vol. II, Plate 44) as from Camden.

Also, two chipped blades (13,648–49), one from Darlington County, and four unfinished ceremonial axes, commonly called banner stones, (13,597–99, Camden; 13,652, Dr. Barrott); two polished celts (13,594–95), Dr. Gibbs; a triangular pyramidal-shaped polishing stone (13,612), and a fetich stone (13,611), consisting of an iron-stone concretion with a naturally head-shaped top wrought with the representation of mouth, and other lines artificially sharpened to heighten resemblance to a sitting animal figure. It is labelled "from the foot of an Indian mound, S. C."

Also seven polishing mullers (13,606–07, 13,614, 13,664–67); a paint muller (13,608); a quartzite paint-stone (13,605), Camden, and six quartzite stones for the game of chunkee. One of the latter (13,603), Plate 5, Fig. 3, 5½ inches in diameter, has been worn or broken through the middle, and is inscribed: "Mound at Bellmont, near Camden, S. Carolina." Another (13,602), Plate 5, Fig. 1, 5⅛ inches in diameter, is exquisitely wrought of white translucent quartzite. Another (13,556), Plate 5, Fig. 2, 4 inches in diameter, is highly polished, with perforation, and arrow-like marks on transverse diameter. Another (13,669) is smaller, and also perforated.

Also a very large soapstone cooking pot (13,670), with rudimentary handles, 19 inches in greatest diameter. The majority of these objects bear the label "Wm. Blanding to Dr. S. G. Morton, 1845." They are in part figured by Schoolcraft in Vol. IV, Plate 16, and are described in the same volume, page 155, by the Rev. George Howe, in *An Essay on the Antiquities of Congaree Indians of South Carolina.*

Tennessee.—A jasper arrow-head (13,643) from Montgomery County has been presented by Mrs. W. H. Miller.

Virginia.—A very delicately chipped flint spear-head (13,516) 4½ inches in length, and a sharpened celt (13,615) 4½ inches in length from Prince Edward County (Dr. Langhorn);

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[1] The identification of this, and the other stone objects in the Miller collection, was made by Mr. Cushing.

a chipped blade (13,622) from Bedford County; and four flat discoidal shell beads (13,518), perforated through longest diameter, with unmarked faces, one inch to half-inch in diameter, from Gloucester County (Dr. Jones), have been presented by Mrs. W. H. Miller.

MEXICO.

Mrs. J. A. Petrie has presented fourteen flaked obsidian knives (13,765) from Tenochitlan, and Wells M. Sawyer, Esq., of Washington, an impression of the seal of the Inquisition in Mexico (20,131) from an original seal in his possession.

CENTRAL AMERICA.

Darien.—Mr. Henry Gregory Granger has given a comb (20,129) made and used by the Cuna Indians of the Isthmus of Darien.

PERU.

The collections from Pachacamac are being arranged and catalogued preparatory to publication by Dr. Uhle.

POLYNESIA.

Samoa.—Mr. James Kingsbury presented a model of a canoe (19,932), and Miss S. W. Bonsall, a piece of tappa cloth (20,081) collected by Captain Joshua Bishop, U. S. N.

MELANESIA.

Fiji.—Mr. James Kingsbury presented a war club (19,930); Dr. Max Uhle, a carved wooden spear (20,058).

New Caledonia.—Two steatite sling stones (19,885) and a jade celt (19,884) have been presented by Mrs. William H. Miller.

Solomon Islands.—Mr. James Kingsbury presented a basketry shield (19,931), four spears (19,915–18), three bows (19,919–21), sixty-one arrows (19,922), four carved paddles (19,924–27), bow drill (19,914), water bottle (19,923), carved wooden idol (19,929), and a polished celt (19,928); Dr. William Pepper six spears (20,025–30), one bow (20,024), and fifteen arrows (20,021–23).

AUSTRALIA.

Mr. James Kingsbury has presented two boomerangs (19,933–34), a polished celt (19,955), and a carved wooden shield (19,935).

ASIA.

THE FAR EAST.

China.—Dr. Edward Bedloe, late United States Consul at Amoy, has presented sixteen ceremonial pikes (19,956–64), such as are placed in front of Yamun or official residences; and Mr. Robinson Tyndale, a Chinese bow and six arrows (19,889), such as were used down to the period of the late war. Mr. R. C. H. Brock has presented a book of Chinese pith-paper pictures (19,896) of Peruvian costumes.

Japan.—Dr. D. B. McCartee has presented a rubbing (20,059) of a Sanskrit inscription in the Kwannon Temple grounds at Asakusa, Tokio, concerning which, in a private letter to Mr. Benjamin Smith Lyman, he writes as follows:

"Two weeks since, having occasion to visit Asakusa, it occurred to me that a rubbing from a large stone in the Kwannon Temple grounds might be acceptable, as a curiosity at least, to the philological and archæological societies connected with the University of Pennsylvania. I went into the temple and asked the priests to have a couple of rubbings made for me from a large slab of stone which is in the temple grounds on the west side, and which has on its face an inscription in the Nepalese style of Sanskrit of the 'Dharani of the honored diadem on Buddha's cranium.' This is the title in Chinese characters on the upper part of the inscription. It was the Chinese title which attracted my attention some sixteen or seventeen years ago, and interested me because it was the same title as is inscribed upon an inscription in seven different styles of writing on one of the arches of the gateway at the Kü-yung kwan (pass) of the great wall north of Peking. The late Mr. Alexander Wylie wrote an article on that inscription, which I sent to the American Oriental Society, and when I saw the stone at the Kwannon Temple I got a rubbing, which I also sent to the American Oriental Society. Happening to mention it to Sir Ernest Satow, he had a rubbing made, and refers to the inscription in his (and Hawes') hand-book for Central and Northern Japan, where, he says, that the Asakusa inscription is an 'imperfect copy.' As to this I cannot say, but I believe it is true that 'all the Sanskrit originals which have reached Japan appear to have been written in this character,' so far as my experience goes. The shapes of the characters differ so from the 'orthodox' Sanskrit that the translator of the *O dai ichi ran*, or 'Annales des Empereurs du Japon,' was puzzled by them."

Satow's reference to the Asakusa inscription in the *Handbook for Central and Northern Japan* (1881, p. 34), is as follows: "A large stone with an inscription on its face in Sanskrit, which is an imperfect copy of the *But-chô son-shô Darani*, or 'Dhârani of the honored diadem on Buddha's cranium.' The character used is the old Nepalese alphabet, in which all the Sanskrit originals which have reached Japan appear to be written."

Referring to Mr. Satow's translation of the title, Mr. Lyman writes: "The proper translation of the title, *But-chô son-shô Darani*, appears to be, according to some Japanese friends of mine, 'Buddha-supreme honorably-exalted Dhârani;' Buddha being used here, as often happens, in the sense of 'all-wise.'"

Mr. Joseph U. Crawford has deposited the Order of the Rising Sun (20,077) and three gold ôbans (20,078–80) presented to him by the Government of Japan in recognition of his services in introducing the American railway system into that empire.

Mr. Edward Starr has presented a lacquered lion mask (19,891) with movable jaws, anciently used in ceremonial dances.

Korea.—Dr. E. B. Landis, of Chemulpo, has presented a *ho-hpai*, or "name tablet" (20,032), an original of the kind figured in the last BULLETIN. He has also sent two of the identification tablets, *yo-hpai*, of which he gives the following account:

"One type (20,099) is square and the other (20,098) round. They are used by the servants of the various Government Boards to prove their identity in drawing their monthly allow-

Fig. 1.

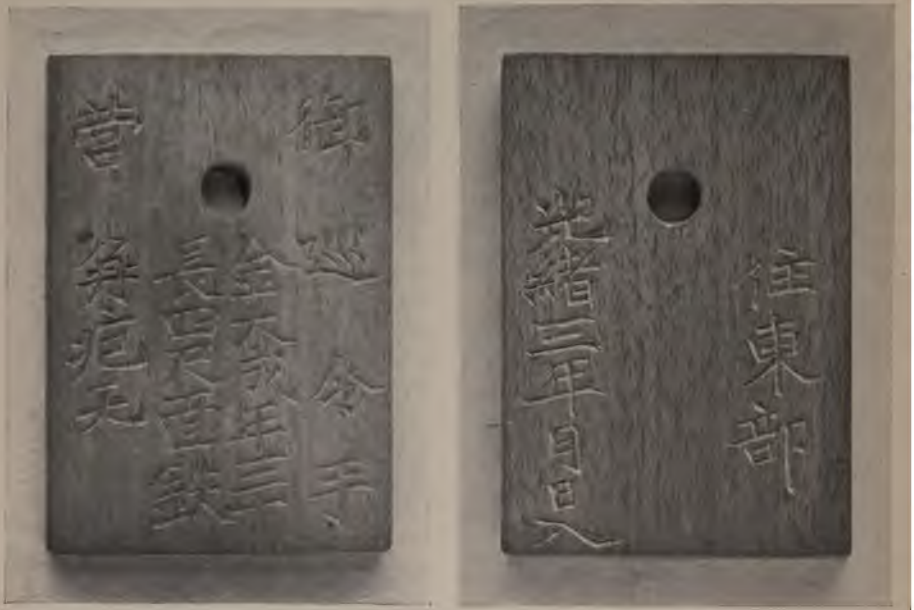

Fig. 2.

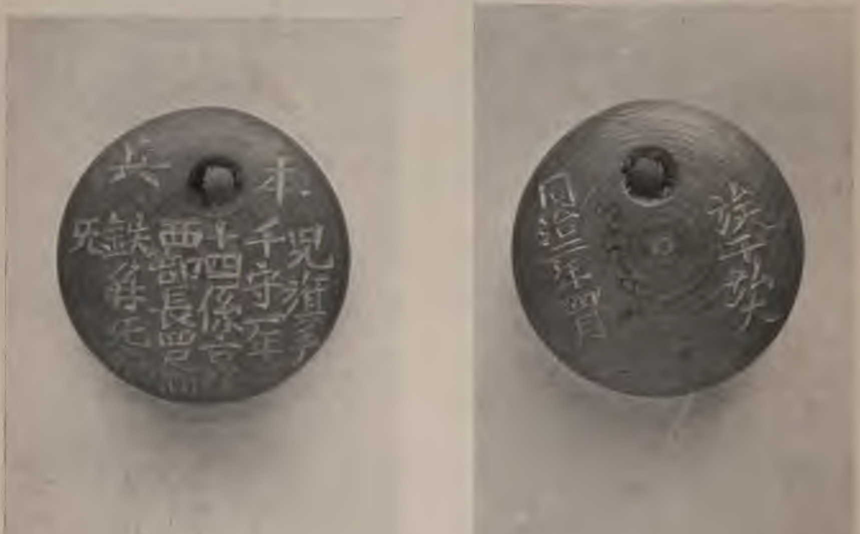

Plate 6. Yo-hpai. Indentification Tablets (20,099, 20,098). Korea. Actual size. Collected by Dr. E. B. Landis.

ance of grain. This class of people, it will be remembered, belong to inferior grades of society, and do not possess *ho-hpai*, of which these tablets may be regarded as a form.

There is, first, the square one, Plate 6, Fig. 1. The inscription at the top reads, "Camp of the Royal Guards," and signifies that the holder belongs to that department of the Government service. To the right (reading from top to bottom) is the name of the position occupied by the holder, in this case a bugler. Then follows his name, his age, his height, and a description of his face (in this case showing that his face is full, beardless, and without moles or birth-marks. On the opposite side is, on the right, his place of residence, and, on the left, the date of issue.

Secondly, the round type, Plate 6, Fig. 2.

The bearer of this one is supposed to be attached to the Board of War. In the same way, beginning at the right and reading from top to bottom, we find that he is a standard-bearer, with his name, his age (24 years), that he is attached to the garrison of the Capital, and that he lives in the Western District. That his height is four feet (Korean measurement), his face full and beardless, and without moles or birth-marks. On the opposite side is the name of one of his relatives, who acts as security for him, and to the left is the date of issue. The originals have the seal burned in the back."

CEYLON.

Mrs. Cornelius Stevenson has presented a metal stylus and specimens of palm-leaf writing (20,096–97).

INDIA.

Dr. Max Uhle has presented a Maharatta manuscript (20,061), from the collection of and with the autograph of Lady William Bentick.

PERSIA.

Mrs. Cornelius Stevenson has presented a lacquered pen case (20,095), containing a pewter ink well and reed pen.

AFRICA.

Cairo.—Mr. Caleb Milne has presented an embroidered leather sheath (19,890).

Mozambique.—A knife in carved wood scabbard (20,043) and an assagai (20,039) have been obtained by purchase through Mr. F. Kulka, Cape Town.

Zanzibar.—A carved ebony comb (20,044) has been purchased through Mr. F. Kulka.

Zululand.—A woman's beaded belt and apron (20,041), worn by wife, and a beaded necklace (20,042), worn by daughter of Languana, Zulu chief, collected by Mr. F. Kulka, have been acquired by purchase.

EUROPE.

France.—A polished celt (13,558) and two polished celts (13,560), found in the Seine at Paris, has been presented by Mrs. W. H. Miller.

Germany.—A polished celt (13,561) from Mayence has been presented by Mrs. W. H. Miller.

Great Britain.—Mr. Horace J. Smith has presented a flintlock spring gun (19,895) purchased in a shop at Stratford on Avon; a "man trap" (19,893), and a painted sign: "NOTICE BEWARE OF SPRING GUNS AND MAN TRAPS" (19,894). Mrs. W. H. Miller has presented four polished celts (13,559 a, b, c, d) from Ireland, four flint blades (13,545) from Philiphaugh, Scotland, and an arrow-head (13,551) from Dunlace Castle.

Hungary.—Miss Livingston has presented a Croatian costume (19,887).

Scandinavia.—Fifteen chisels and celts (13,525, 13,562–74); four semi-lunar knives (13,529–30, 13,582–83), the two latter from Sweden; four flaked knives (13,526–27, 13,575), ten daggers and knives (13,328–31, 76–82, 85), and a perforated stone axe (13,586), have been presented by Mrs. W. H. Miller.

Tyrol.—Dr. Horatio C. Wood presented a leather riding belt (20,082) ornamented in quill work, with the name "Faria Kramblichler," which he collected in the mountains of Central Tyrol.

SPECIAL COLLECTIONS.

American History.—The numerous gifts of objects of historic interest, many of which illustrate obsolete or fast-disappearing customs, has led to an effort to form a collection illustrative of life in the American colonial epoch, with special reference to the State of Pennsylvania.

Fans.—Mrs. Lucy Wharton Drexel has added the following fans to her collection in the Museum:

20,033. French fan; silvered pearl sticks, 19th century.

20,034. French fan; gilded pearl sticks, 19th century.

20,035. French fan; gilded pearl sticks, 19th century.

20,036. Painted fan. Swan skin; Louis XV.

20,092. Painted fan. Swan skin, with carved and painted ivory sticks. Louis XV.

20,093. Spanish fan; bull fight.

20,107. Spanish fan.

20,108. Chinese ivory fan, carved with longevity symbols and horary animals. 18th century.

20,109. English fan; ivory sticks with white silk tissue and silver spangles, and English stipple medallion inserted.

The following is written on the cardboard case: "1894. This fan was given by her Father to Miss Morris, of N. Y., a sister of Mrs. Jno. Dagworthy, my great-great-grandmother, for a party on her 16th birthday, about the year 1719.

"W. KEY HOWARD, JR."

Dr. William Pepper has deposited in the Drexel collection of fans a Brazilian feather fan (20,094) received from Captain Cordeira da Graça, E. C.

Fire-making and Lighting.—This, the last of the special collections undertaken in the Museum, has received a number of interesting accessions. Mrs. Charles C. Harrison presented two rush-light holders (20,065, 20,066), Figs. 12, 13, collected by her during the past summer at Yspytty, in North Wales. Among other objects are sticks (18,266) used for dipping candles from Chalkley Hall, Philadelphia, presented by Edward Wetherill, Esq., and a tinder box (18,334) with flint,

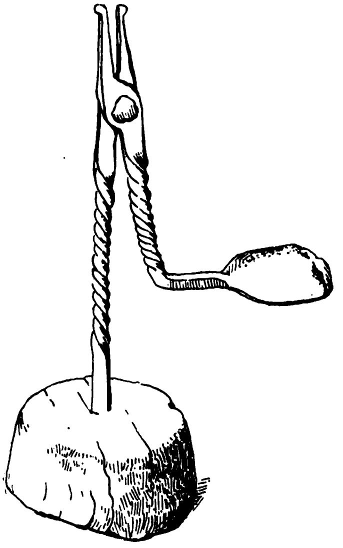

Fig. 12.

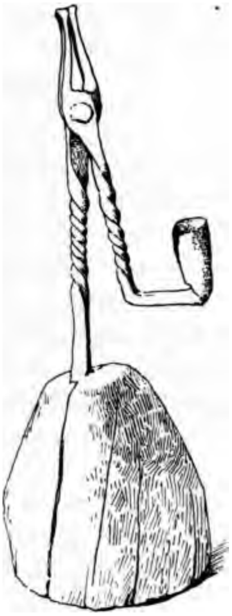

Fig. 13.

Rush-light Holders (20,065–66), Yspytty, North Wales. Gift of Mrs. Charles C. Harrison.

steel, tinder, and sulphur-tipped matches from Mrs. William Frishmuth.

The Rev. Samuel J. Blum, Principal of Nazareth Hall, Nazareth, Pa., has given a pair of ancient iron snuffers (20,016) from Nazareth.

Mr. Charles Laubach, of Riegelsville, Pa., has given an ancient steel with tobacco-pipe prick (20,100), three sheet-iron lard-oil lamps (20,102–04), a pewter "fluid" lamp (20,101), a blacksmith's forge lantern (20,105), a perforated tin lantern (20,119), and a pair of iron snuffers (20,114). Mr. Laubach writes that one of the lard lamps was used by his grandfather, John George Laubach, from 1796 to 1863, when he died, at the age of eighty-nine years. The other two were also used by his grandfather, and afterwards by his uncle, and bought at his sale a few years ago. "The wicks of the earlier lamps were made by twisting tow very tightly. Early in this century the wicks were made by twisting cotton in the same way. Later

(1850) the wicks were bought ready twisted. The blacksmith's lantern was used by John Dickson during the early part of this century for lighting his blacksmith shop. He died in 1889, aged nearly ninety-eight years. His father had been a blacksmith at the Durham Iron Works, as also his grandfather. The latter helped to manufacture the 'great chain' across the Hudson during the Revolutionary War. The perforated tin lantern was used from 1812 to 1850. The snuffers were used in my father's family from 1828 to 1850."

Mrs. Jacob H. Lazarus, of New York City, has given an antique brass candlestick (20,136); Mr. George Washington Fackenthal, P. M., Riegelsville, Pa., a pair of antique handirons (20,073), and a pair of tongs (20,074), from Bucks County, Pa., and Miss Louise Claghorn an antique Roman lamp (20,124).

Games.—The Museum has received from the Cav. A. Milani, through the courtesy of Prof. Henry H. Giglioli, of Florence, casts of the following dice and gaming pieces in the Royal Archæological Museum, Florence.

A. In the Egyptian Museum:

20,083. Pyramid-shaped die of ivory, with points inlaid with amber and numbered up to "four," with "one" repeated.

20,084. Man, button-shaped, of greenish glass.

20,085. Man, spindle-shaped, blue porcelain glaze.

20,086. Man, similar to preceding, but smaller.

20,087. Man, lozenge-shaped; agate.

B. In the Etruscan Museum:

20,088. Cubical die of bone, numbered up to 6 with concentrically cut points.

20,089. Die; three united, each numbered on the sides with the points: 3, 4, 5.

20,090. Cubical die, numbered only on one side with four points.

20,091. Man, of serpentine, facetted on one side.

Dr. Max Uhle has presented a pack of Trappola cards (20,111) used in Silesia and made by F. A. Lattmann, Goslar, and Mr. F. Webb Hodge, of Washington, a pack of Spanish cards (20,122) purchased in Mexico and manufactured by the

Consolidated Card Company of New York. Mr. Frank Hamilton Cushing presented a set of four canes (20,031) for the game of *Sho-li-we*, from Zuñi, N. M., and Dr. T. P. Martin, of Taos, N. M., a set of staves and counting sticks (20,123) for the Tewan game of *Ca-se-he-a-pa-na* (Spanish, *Pastore*) as played at Taos. Both Mr. Cushing and Dr. Martin have also contributed detailed accounts of these games, which will appear in the catalogue of the joint exhibit of the University Museum and the United States National Museum at the Atlanta Exposition in the *Report of the United States National Museum* for 1896.

Numismatics.—The Museum has been fortunate in receiving as a deposit an extremly valuable collection, consisting in greater part of gold and silver, which has been in part placed on exhibition in the American Hall. The portion exhibited comprises American Colonial and State coinages; United States gold and silver; coins of Mexico, the Central and South American States; of Great Britain, France, Belgium, Switzerland, Spain, Portugal, Italy, Russia, Bulgaria, Roumania, Servia, Greece, Turkey, India, Africa, China, and Japan. In addition, there is a valuable series as yet undisplayed of the coins and medals of Austria, Germany, Netherlands, Denmark, Norway, and Sweden, and some very fine Greek and Roman gold coins.

The American colonial coinages are of extreme rarity and value, comprising a set of the Summer Island (Bermuda) pieces, shilling, sixpence, threepence, and twopence, from the Montague sale; a New England shilling; twelve Massachusetts shillings, two Massachusetts sixpences, and four twopences, one of the latter of copper. The Lord Baltimore coinage includes, in addition to the shilling, sixpence (two) and groat, the excessively rare penny (but one other is known) from the Montague sale. In the Rosa Americana series (thirty-two specimens) are many rare types, while the Wood coinage comprises the II, I, and ½ d. figured by Crosby (Plate III, 10–13). Among other rarities are the Chalmers' shilling, with thirteen links on the reverse (Crosby, Fig. 68).

The collection of American gold is peculiarly complete and valuable, comprising among other rarities the 1815 and 1822 half eagle. Among the private gold issues are a representative series of California, Colorado, Georgia, North Carolina, Utah, and Oregon coinages. The American silver: dollars, half dollars, quarters, twenty cents, dimes, and half dimes is arranged with reference to mint marks, in accordance with Haseltine's type-table catalogue.

An interesting series of medals of the Columbian celebration (1892–1893) has also been deposited, comprising the Barcelona medals (4); Huelva (3); Madrid (16, including the official silver and bronze medals); Milan (3); Genoa (2); New York (1), and Chicago (19).

Dr. S. Weir Mitchell[1] has presented a silver medal (18,333) of the University of Pennsylvania, awarded to G. Read, 1814, Fig. 14.

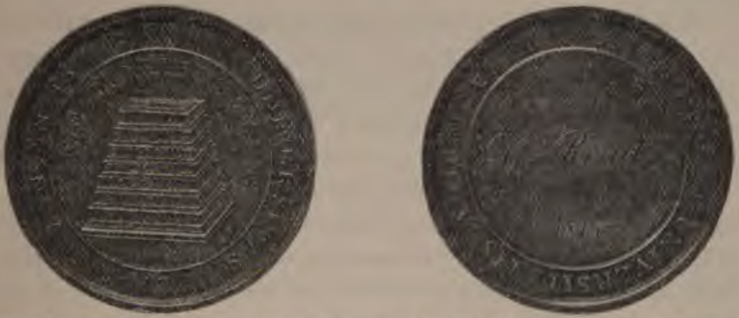

Fig. 14.—Medal of the University of Pennsylvania, 1814 (18,333). Gift of Dr. S. Weir Mitchell.

Obverse: Seal of the University; reverse, Leg. AUCTORITATE UNIVERSITATIS ADJUDICATUM. In field (engraved in script), G. Read, 1814. Size, 26.

Mr. A. S. W. Rosenbach, who kindly undertook the inquiry, has furnished the following particulars concerning the medal, extracted from the minutes of the Proceedings of the Board of Trustees (MS.):

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[1] Dr. Mitchell kindly states that the medal was found among the papers of his old and valued friend, George Read, Esq., and was given to him by his nieces, the Misses Fisher, daughters of Coleman Fisher, Esq.

Thursday, November 23d, 1813.—3. "At the examinations suitable rewards shall be assigned to such of the Students as shall have distinguished themselves by obedience to the Statutes and Discipline of the University and by proficiency in their studies, and the Faculty in the Arts are requested to digest and propose regulations upon this subject."

Thursday, March 1st, 1814.—"A letter of this date was received from the Faculty, on the subject of the third article of the report of the Committee to whom the Provost's communication of the 11th October was referred, recommending the having medals struck for the purposes mentioned in the said communication and report, which being considered was reported to Mr. Hopkinson and Mr. Meredith to take order thereon."

Tuesday, May 3d, 1814.—"The committee appointed the 1st day of March, to have Medals struck, agreeably to the suggestion of the Faculty made the 2nd November and of the report of the Committee on that subject of the 23 November, reported that they had employed the gentlemen of the United States Mint for that purpose, who had obligingly executed the same by sinking a Die and stricking therefrom 30 Medals in fine Silver; which were produced by the committee of the Board, together with a Bill amounting to $78.78 for the work done and the Silver contained in the said Medals."

Thursday, June 7th, 1814.—"An account for making the Medals ordered agreeably to the resolution of the Board, and for the Silver, amounting to $78.78 presented at the last meeting was ordered to be paid."

Saturday, January 7th, 1815.—"Ordered, that the Committee upon the general rules report to the board, as soon as conveniently they can, a permanent plan for the distribution of Medals."

Tuesday, May 4th, 1819.—"That it is inexpedient to adopt the plan of distributing Medals as honorary distinctions among the students of the University."

In the Biographical Catalogue of the Matriculates of the College, 1749–1893 (Philadelphia, 1894), there appears the entry under the Class of 1817: George Read, A. M., b. Phila-

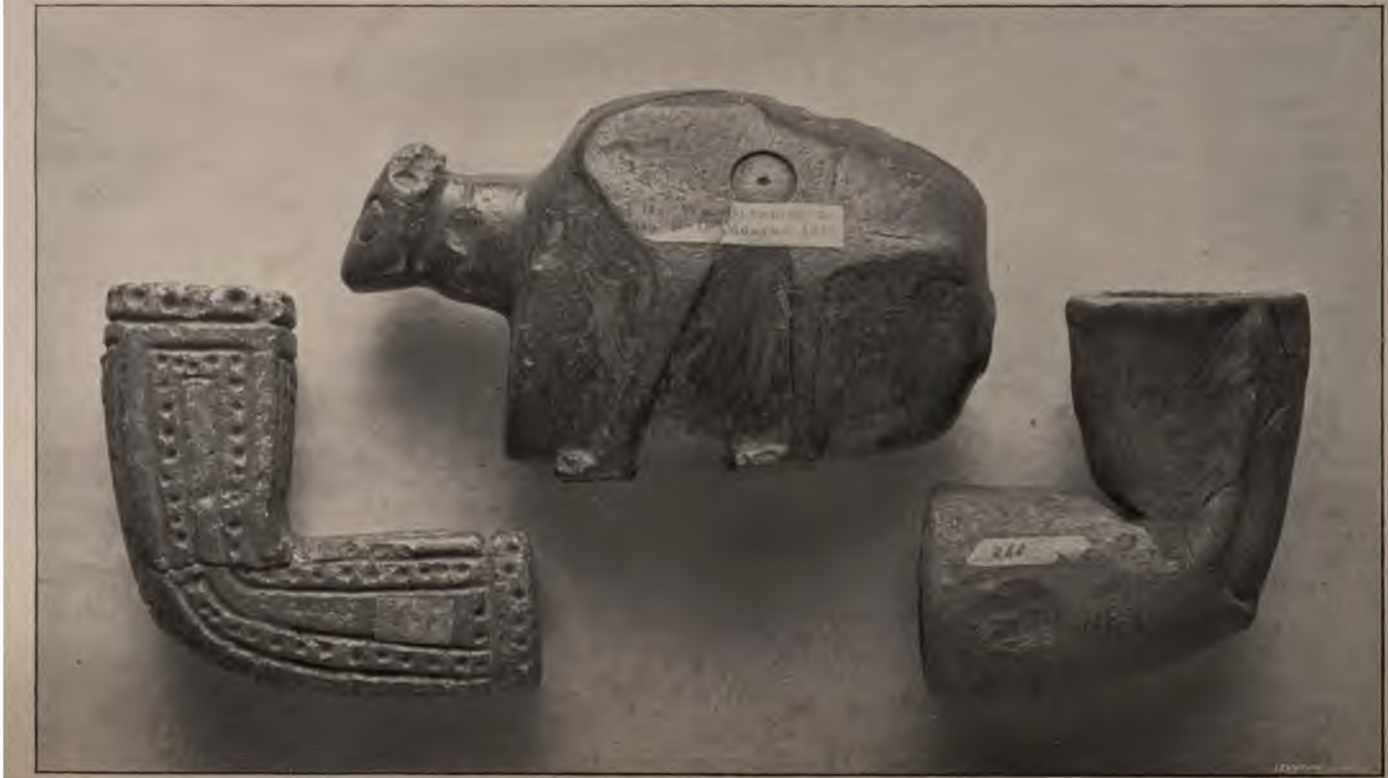

Fig. 1.

Fig. 2.

Fig. 3.

Plate 7.—Fig. 1. Soapstone Pipe (13,554). Fig. 2. Soapstone Pipe (13,601)—Bear. Fig. 3. Terra-cotta Pipe (13,598). Kershaw, S. C. ½. Formerly in the collection of Dr. Samuel G. Morton. Gift of Mrs. H. W. Miller.

delphia, June 10th, 1787, d. Philadelphia, March 18, 1889. s. William Read and Anne McCall. Entered 1814, Moderator Philo. U. S. Consul Malaga, Spain, 1817–55."

The dies, and a similar medal granted to Samuel Marx, A. M., of the Class of 1815, are conserved in the archives of the College.[1] In the Matriculate Catalogue there appears under Mr. Marx, name: "Awarded a silver medal for scholarship," but there is no mention in the catalogue of the medal of Mr. Read, or of any similar award.

Gifts of coins have been received from Octavio A. Gamez, 1900, M. D.; Mr. A. Sidney Millward, and from Mr. T. Colvin Randall.

Pipes.—The following specimens have been presented by Mrs. W. H. Miller:

13,537. Terra-cotta pipe bowl, with double row of reed impression decoration on either side; accompanied by the following label: "Taken from an Indian grave, on the plantation of Rosalie King, in Liberty County, Georgia. The skeleton was found in a sitting posture, with the hands in the lap, holding this pipe and two balls like the accompanying. This pipe, when whole, was of this shape U, but was, unfortunately, broken by a mischievous boy and the other half lost. The other ball was retained by Mr. King, Liberty County, Georgia, March 25th, 1853. J. C. I."

13,538. Terra-cotta pipe, Plate 7, Fig. 3, with junction ridges and lozenge-shaped double lines, simulating lacings, derived from pieced tube of gourds or large canes. "Kershaw, S. Carolina, Dr. Blanding." "Dr. Wm. Blanding to Dr. S. G. Morton, 1845." Imperfectly figured by Schoolcraft, Vol. 2, Plate 43.

13,554. Soapstone pipe (copy of terra-cotta pipe), Plate 7, Fig. 1, with line and dot decorations. Label: "This pipe was dug up at the Friends' Graveyard, Camden, S. C., about 2 feet below the surface. The site of an ancient Indian town, half a mile from the Wateree. Presented me by Col. J. Kershaw. W. Blanding." Incorrectly figured by Schoolcraft, Vol. 2, Plate 43.

---

[1] The medal of Samuel Marx has since been placed in the Numismatic cabinet in the Museum (20,150).

13,601. Large soapstone pipe, Plate 7, Fig. 2, with tubular bowl, representing bear. Extreme length, 6½ inches. From Camden, S. C. "Dr. Wm. Blanding to Dr. S. G. Morton, 1845." Imperfectly figured by Schoolcraft, Vol. 2, Plate 45.

13,536. Soapstone horn-shaped tubular pipe or smoking tube, 5¼ inches in length, with the following label: "This pipe was dug up on the bank of Little Pine Tree Creek, near Camden, S. C., at Carter's Mills, 9th July, 1829, and presented to me by Captain B. Carter. W. Blanding." "Dr. Wm. Blanding to Dr. S. G. Morton, 1845."

13,539. Green soapstone pipe of flat taper-stemmed variety, showing defective stem perforation, with numeric scoring near tip, and pottery derived decoration on bowl.

13,521. Very early catlinite pipe, of plain form, but showing enclosed lozenge-shaped decoration at either side. Length, 4⅛ inches. Probably Mandan or Aricaree.

13,522. Laurel root pipe in form of the typical Cherokee stone pipe, decorated with run-in lead bands at top of bowl and at stem end.

13,523. Modern clay-stone pipe of Southern Indians, with perforated plume-comb at base, and short alder wood stem.

13,540. Pewter tomahawk pipe; wooden stem, bound with bands of German silver to represent quill decorations of primitive period. Length of stem, 17 inches. Probably Sauk and Fox, Iowa.

LIBRARY.

The following are among the most important acquisitions since the last issue of the BULLETIN :

Galerie Americaine du Musée d' Ethnographie du Trocadéro, choix de pièces archéologiques et ethnographiques décrites et figurées par le Dr. E. T. Hamy, Ière partie. Paris, 1897.

Gift of *M. le Duc de Loubat.*

Die Ruinstaette von Tiahuanaco in hochlande des alten Peru. Ein kulturgeschichtliche studie auf grund selbstaendiger aufnahmen von A. Stübel und M. Uhle, Breslau, 1892.

Gift of *Dr. Max Uhle.*

Certain Aboriginal Mounds of the Georgia Coast, by Clarence B. Moore. Inhumation and Incineration in Europe, by the Marquis de Nadaillac. Philadelphia, 1897.

Gift of *Clarence B. Moore, Esq.*

The Testimony of Tradition. London, 1890.

Fians, Faries, and Picts. London, 1893. By David MacRitchie.

Gifts of the *Author.*

Compte-rendu de la Commission Impérial Archéologique. 1891–1894.

Matériaux pour servir à l'archéologie de la Russie. Nos. 13–20.

Gifts of the *Imperial Russian Archæological Commission.*

Apuntés de Epigrafía Mexicana por Jesús Galindo y Villa. Mexico, 1894.

Gift of *La Sociedad "Antonio Alzate."*

Reports of the New York State Museum. 1889–1895, 10 volumes.

Gift of the *University of the State of New York.*

Ethnographische Musea in Midden-Europa door Dr. J. D. E. Schmeltz. Leiden, 1896.

De Wajang Poerwå eene ethnologische studie door L. Serrurier. Leiden, 1896.

Gifts of the *Rijks Ethnographisch Museum*, Leiden, Holland.

Reports of the Peabody Museum of American Archæology and Ethnology, Vol. II, 1876–79; Vol. III, 1880–86.

Memoirs of the Peabody Museum of American Archæology and Ethnology, Vol. I, Nos. 1, 2, and 3.

Contributions to the Archæology of Missouri, Salem, Mass., 1880.

Gifts of the *Peabody Museum.*

EXCHANGES.

An exchange of publications has been made with the following additional societies and institutions since the last issue:

Berliner Gesellschaft für Anthropologie, Ethnologie, und Urgeschichte.
Kansas State Historical Society, Topeka, Kansas.
Koloniaal Museum, Haarlem.
Kroatische Archäologische Gesellschaft, Agram.
Manchester Geographical Society, Manchester, England.
Leland Stanford University, Palo Alto, Cal.
Sociedad "Antonio Alzate," Mexico.
Numismatic and Antiquarian Society of Montreal.
La Société d'Anthropologie de Paris.
Archæological Museum, Toronto, Canada.

LECTURES.

The afternoon lectures on the Museum collections will be resumed in the American Hall in the Library Building, Thirty-fourth and Woodland Avenue, on Wednesdays at 4 P. M., after the first of the year.

FREE MUSEUM
OF
SCIENCE AND ART,
Department of Archaeology and Paleontology,
UNIVERSITY OF PENNSYLVANIA.

BULLETIN No. 3.
APRIL, 1898.

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PRINTED FOR THE MUSEUM,
PHILADELPHIA.
1898.

THE object of this Bulletin is the publication of new material acquired by the Museum of Science and Art of the University of Pennsylvania, with accounts of explorations conducted by the Museum and original investigations based upon its collections. The subscription price is One Dollar per year (four numbers).

Communications should be addressed to

THE EDITOR OF THE BULLETIN,
Museum of Science and Art,
University of Pennsylvania, Philadelphia

BULLETIN

OF THE

Free Museum of Science and Art

OF THE

UNIVERSITY OF PENNSYLVANIA.

No. 3. PHILADELPHIA, APRIL, 1898. VOL. I.

AMERICAN INDIAN GAMES.[1]

By STEWART CULIN.

Our ideas of a game are primarily associated with mirth, amusement, play, such, indeed, being the original meaning of our English word. A careful examination of games, however, reveals the fact that they originated not as pastimes, but as serious divinatory contests. This is especially true of the games of those we call primitive people or savages.

We quickly find that a distinction may be drawn between these sacred and divinatory games and the mimetic plays of children. In speaking of games I shall confine myself to the former class alone. The latter constitute another, though related chapter, in the history of culture. Children play at real games as they play at every other serious business of life. They thus perpetuate games that have otherwise disappeared. Hence the value of children's games in our study. At the same time, this observation applies chiefly to the higher cultures. In savagery we deal with the games of adults,—first of men, then women,—with games so complex that no child-mind could grasp their principles or objects; with games so wrought and interwoven with primitive concepts of nature and the universe that no modern mind could create or invent them.

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[1] Presidential Address, American Folk-Lore Society, Baltimore, Md., December, 1897.

When we review the true or divinatory games of the world, no matter how or in what manner they are played, we find their underlying objects and principles precisely the same. One and all they appear as aids in that instinctive process of classification by which humanity endeavored to establish the connotation of unrelated facts, as the devicés through which the gods or the cosmic forces might be led to reveal the unknown or hidden relations that exist between man and his environments. The central idea upon which this classification is based, as first distinctly insisted upon by my distinguished colleague, Dr. Daniel G. Brinton, is that of the four quarters of the world. Corresponding with the world quarters, we have the four seasons. With these, again, are associated the primary colors. By the aid of simple and obvious analogies we may extend the classification to beasts, birds, and men; to human relations, family and communal, secular and sacerdotal; to inanimate nature, the stars, the sentiments, emotions, to everything, in fact, for which the tongue has framed a name. Such indeed is the comparatively simple mental process that we find to have been practically common to mankind. I should mention here that with the Four Directions was associated a fifth, the Centre, thus establishing categories of fives instead of fours, and again with these Five Directions, the Aboveand Below, the Upper and Lower regions, extending the number of directions to seven. Not infrequently we discover the intermediary points assuming equal importance with the quarters, resulting in a division among eight, or with the middle, nine. Yet another assignment to the world quarters and their extensions, of high importance in games, remains to be considered, that of number. Thus, the number attributed to the North may be one; to the West, two; to the South, three, and to the East, four; or the numbers from one to nine may be distributed among the eight points of the circuit and the centre.

Another fact of importance should also be noted: the connotations of direction and color are not invariable, and do not agree

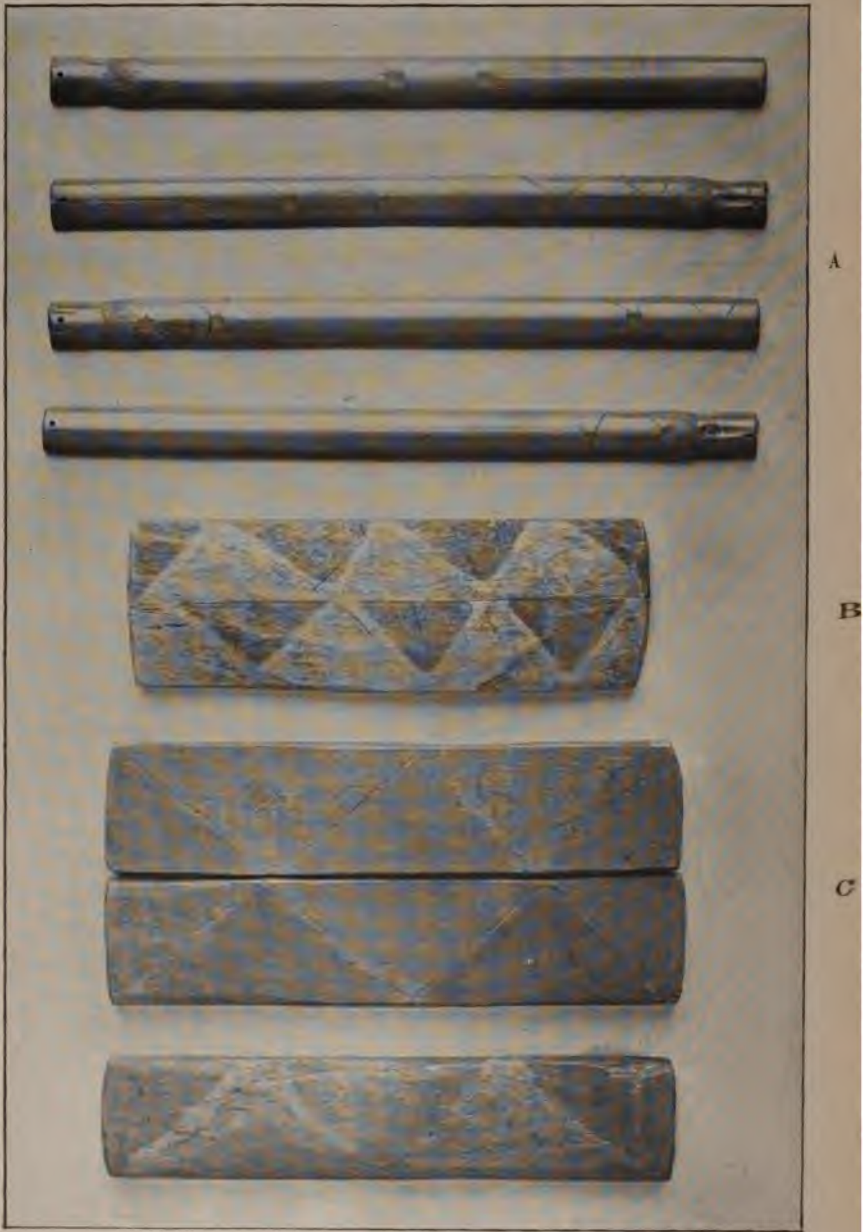

Plate 8.—Zuñi cane and wood gaming staves; obverse, showing derivation of chevron pattern on wooden staves from engraved canes. A, Set of four canes, United States National Museum, 69,277; B, Painted stave, one of set of three, United States National Museum, 69,003; C, Set of three painted staves, Museum of Science and Art, 16,241.

in the Old and New Worlds—do not agree, in fact, between adjacent tribes on the American continent.

Having thus outlined the fundamental principle underlying games, I desire, before proceeding to the immediate subject of my address, to say a few words as to the methods we should employ in the comparative study of games to insure results of certain value in ethnographic science. Collection and publication, while in themselves diverting, are merely preparatory. They but afford us materials with which to approach the solution of one of the important problems in man's life and development; that of the interdependence of his culture and the location of the centre or centres from which it emanated.

Superficial comparisons, however close the similarities evoked, amaze, rather than enlighten. Identity of customs and myths are no longer regarded as proof of a common origin, and the functional similarities which characterize games are scarcely of higher ethnical value than those observed by the zoölogist in reviewing the animal kingdom.

There are two kinds of evidence, however, which, taken together, afford promise of trustworthy results in our work; the first we find in linguistics and the second in morphology. From a linguistic side we derive less advantage as yet in the American Indian games than in the corresponding games of Asia. The identity of chess is asserted by its name from China to the shores of the Atlantic; and the Hindu *Pachisi* is recognized and understood from Persia to the Philippines. In America we may trace the analogue of the latter game under its name of *Patole*, from the ancient Aztecs to the existing pueblos of New Mexico. In general, however, the American Indian names of games are descriptive and vary from language to language though sometimes identical among tribes of the same stock.

Experience leads me to attach by far the highest importance to our second source of information: that of morphology. It is their objective side, indeed, that lends to games their peculiar value in the field of study represented by this Society, and a demonstration, based upon the material before me, will form the concluding part of my address. The games of the American

Indians may be arranged in four principal classes, represented by Lacrosse, or batted-ball; Chunkee, or "ring and javelin;" "Straw," or "Indian cards," and "Platter," or dice. This natural classification was employed by Mr. Andrew MacFarland Davis in his admirable memoir[1] which practically exhausted the literature of the subject down to the time of its publication. I have drawn in my own work chiefly upon the resources of museums and the obliging and never-failing assistance of many original observers. With reference to Indian games in general, I desire to say that all the games in each of the four classes named appear to be related, either directly to each other, or to a common source, throughout the entire area of their distribution, and that one of them, at least, appears to have been practically universal in the northern continent. Again, that they present no anomalies, and that corresponding games in three out of the four mentioned classes exist as equally representative and widely distributed games in the Eastern hemisphere.

It would not be difficult to extend the list of typical games, as, for example, by the addition of certain guessing games played with marked bones; but these, like others, will be found to be the products of one of those mentioned.

For the purposes of illustration, I have selected the last of the four classes for exhibition and comment. The games of this class, comprising the platter or dice of the Atlantic Coast, the plumstone game of the Sioux, and the game of tossed canes or staves in the Southwest, I have found recorded as existing among some 61 tribes,[2] comprised in 23

---

[1] *Indian Games*, Bulletin of the Essex Institute, XVII, 89; XVIII, 168.

[2] *Algonquian:* Arapaho, Cheyenne, Chippeway, Illinois, Massachusetts, Menominee, Micmac, Narraganset, Nipissing, Ojibwa, Passamaquoddy, Penobscot, Siksika; *Athapascan:* Apache, Navajo; *Caddoan:* Arikara, Pawnee; *Eskimauan:* Eskimo; *Iroquoian:* Delaware, Huron, Iroquois, Mohawk, Onondaga, Seneca, Tuscarora; *Keresan:* Keres (Acoma, Cochite Laguna, San Felipe, Sia); *Kiowan:* Kiowa; *Koluschan:* Tlingit; *Lutuamian:* Klamath; *Mariposan:* Yokut; *Natchezan:* Natchez; *Piman:* Papago, Pima, Tarahumara, Tepeguana; *Punjunan:* Nishinam; *Salishan:* Clallam, Cowlitz, Lkuñgen, Lummi, Nisqalli, Nslakyapamuk, Queniut, Skagit, Snohomish, Soke, Sushwap, Twana; *Shahaptian:* Klikitat; *Shoshonean:* Comanche, Paiute, Shoshoni, Unikaret; *Siouan:* Assinaboin, Dakota (Sisseton, Teton (Brule)

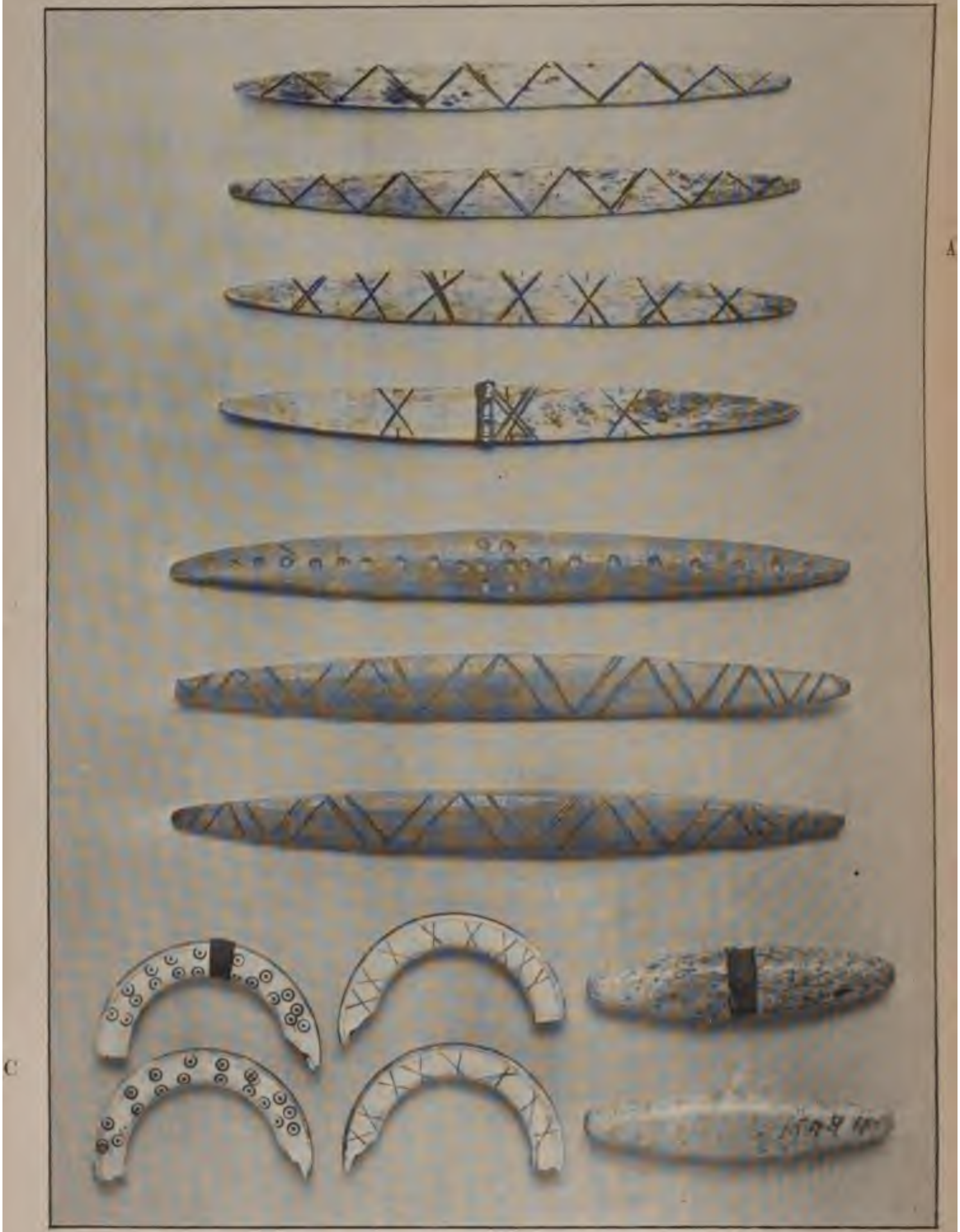

Plate 9.—A, B, Blackfeet bone gaming staves, showing chevron decoration and tied piece; the probable source of the beaver teeth game (C) of the Columbia River, as well as the bone-guessing game implements (D), (one tied) of the northern tribes. A, Blackfeet, Field Columbian Museum, 51,693; B, Blackfeet, Field Columbian Museum, 51,694; C. Twana, Washington, Museum of Science and Art, 20,930; *D,* Alaska, Museum of Science and Art, 15,494.

linguistic stocks, described or collected by some 75 observers,[1] extending from the year 1634 down to the present, and represented by some 90 specimens of implements from 41 tribes, 18 stocks and 39 collectors in the five principal American museums of ethnology: Washington, New York, Chicago, Cambridge, and Philadelphia, and the hands of five individuals. The older accounts of the game among the Indians of Mexico are not included in this enumeration.

Among all these tribes the principle of the game is invariably the same. Two-faced lots are tossed and numerical values attributed to the various combinations. The number of these lots varies from three to 13, four being the most common. Their form and material range from slips of cane, about a span in length, through wooden staves and blocks of various sizes to fruit stones, and disks of bone, and even beans. The numerical counts attributed to their falls in general bear a relation to the number of heads or tails that come uppermost, but the count is often augmented by one or more of the lots, distinguished by marks from the others, turning in a specified manner. The methods of tossing are much diversified. The fruit

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Yankton), Iowa, Mandan, Minnetaree, Omaha; *Tanonan:* Tewa (Isleta, Santa Clara, San Ildefonso, Taos, Tesuque); *Waukeshan:* Kwakiutl, Macah; *Yuman:* Cocopa, Havasupai, Mohave; *Zuñian:* Zuñi.

[1] A. B. Averill, Paul Beckwith, W. M. Beauchamp, Franz Boas, H. M. Brackenridge, J. Breboeuf, Mrs. W. W. Brown, Jacques Bruyas, George Catlin, P. de Charlevoix, E. C. Cherouse, Frank H. Cushing, Dr. Z. T. Daniel, William H. Danilson, Edwin T. Denig, William Dinwiddie, George A. Dorsey, T. S. Dozier, J. Owen Dorsey, L. S. Dyer, Myron Eels, Geo. B. Emmons, Miss Alice C. Fletcher, A. S. Gatschet, George Gibbs, Dr. Gray, George Bird Grinnell, Stansbury Hager, Charles Francis Hall, John N. B. Hewitt, Walter T. Hoffman, G. Wharton James, Peter Jones, J. P. Kimball, J. Lalemant, Le Page du Pratz, Francis Le Fleche, J. Long, G. H. Loskiel, Carl Lumholtz, Charles F. Lummis, Charles E. McChesney, W. J. McGee, C. N. B. Macauley, T. P. Martin, Washington Matthews, James Mooney, Lewis H. Morgan, Joseph Nicolar, Edward Palmer, Nicolas Perrott, Zebulon M. Pike, J. W. Powell, George H. Pradt, Horatio N. Rust, Steven Powers, Henry R. Schoolcraft, H. L. Scott, Benjamin Sharp, Col. James Smith, George E. Starr, James Stevenson, Mrs. M. C. Stevenson, Matthew F. Stevenson, Mrs. G. Stout, James G. Swan, John Tanner, James Teit, Sagard Theodat, J. Hammond Trumbull, H. R. Voth, G. M. West, Roger Williams, Edward F. Wilson, William Wood.

stones and bone disks are usually thrown in a bowl or platter or in a small basket; the canes tossed or shot against a suspended blanket or skin, and the wooden staves struck on a stone, ends down, so that they rebound, hit sharply on a stone held beneath, or allowed to fall from some little height upon a blanket placed upon the ground.

There are two principal methods of keeping count: one by means of a bundle of stick or tallies, of which the observed numbers are 8, 12, 15, 32, 40, 48+4, 48+5, 51+4, and 100; the other, with pieces, now designated as "horses," moved around a circuit usually consisting of small stones arranged upon the ground. The shape of the circuit is either rectangular or circular, and the number of openings, called "houses," 40, although in one instance 160 has been observed. The 40 stones are usually arranged in tens, with reference to the four cardinal points, towards which, when the circuit is circular, larger spaces, called "rivers" are sometimes left open. With reference to the two methods of keeping count, the one with tallies is invariably used when the lots are tossed in a bowl or basket, and with the beaver teeth. On the contrary, the counting circuit is almost always used when staves are employed.

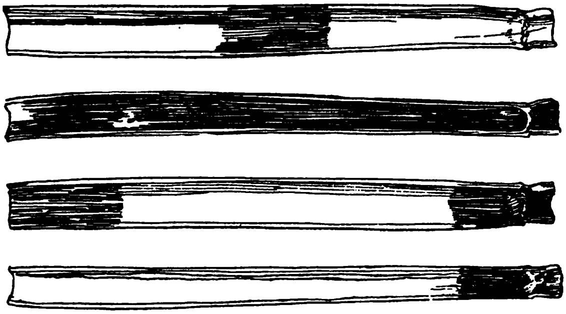

Fig. 15.—Zuñi Canes for *Sho-li-we*, showing inside marks referring to the four directions.

Comparison of such names of games as are recorded reveals no similarities outside of the same linguistic stock.

I shall proceed now to a detailed examination of one of the games of this group as played in Zuñi, and as described to me by my friend and collaborator, Mr. Cushing. It is known in

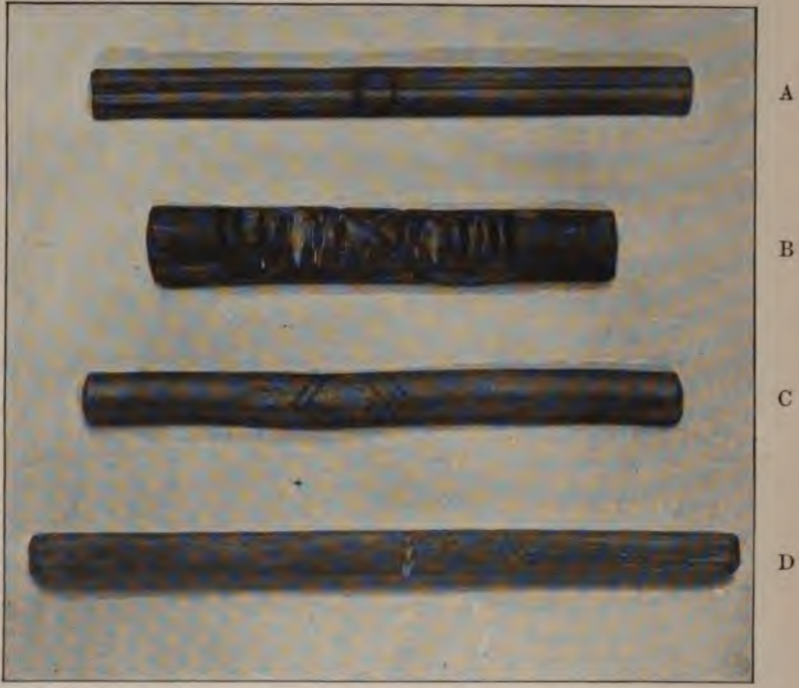

Plate 10.—Obverse of four banded or cross-marked gaming sticks from as many sets, the ones which augment the throw and regarded by the author as the representatives of the atlatl. A, Zuñi (cane), Museum of Science and Art, 16,543; B, Tewa (wood), Museum of Science and Art, 20,153; C, Kiowa (wood), United States National Museum, 152,908d; D, Tepeguana (wood), American Museum of Natural History, $\frac{65}{1038}$

the native language as *shó-li-we*. The lots employed in it are four slips of reed (Plate 8, A) each marked in a distinctive manner on the outer side, and in a corresponding way with black paint within. The name *shó-li-we* is derived, according to Mr. Cushing, from *shoolí*, "arrow," and *we*, plural ending, signifying "parts of," and may be translated, therefore, as "cane-arrow pieces" or "parts." Mr. Cushing has pointed out to me that from the fact that these slips are so split and cut from the canes as to include at their lower ends portions of the joints or septæ, and from the further fact that they are variously banded with black or red paint or otherwise, it may be seen that they represent the footings or shaftments of cane arrows, in which the septæ at the lower ends serve as stops for

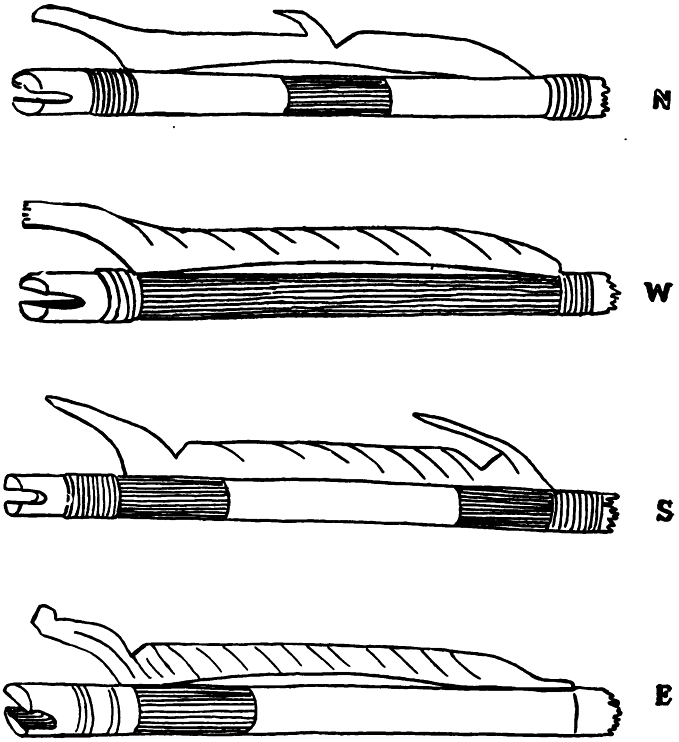

Fig. 16.—Zuñi arrow-shaftments of the four directions. From a sketch by Frank Hamilton Cushing.

the footing or nocking plugs. The bandings of the slips (Fig. 15) are representative of the rib-bandings of cane-arrow shaftments (Fig. 16). Mr. Cushing has found that the arrow sets of Zuñi, as well as the ancestral Cliff Dweller arrows were thus ribbanded with black or red paint, to symbolize in the arrows so marked the numerical signs or mystical values and succession of the four quarters. Each set, especially of war arrows, consisted of four sub-sets, the shaftments of each differently marked. Without dwelling further upon their origin and significance, we find one slip, banded only at the middle, associated with the North, and called the *á-thlu-a*, or the "all speeder," or "sender." Another, blackened its entire length, associated with the West, and called the *k'wí-ni-kwa* or the black. Another, banded at either end, associated with the South, and called the *pathl-to-a*, or "divider divided;" and, finally, the cane slip of the East, banded only at one end and called the *kó-ha-kwa*, "white," or "white medicine."

There is a peculiarity in the method of tossing. The *á-thlu-a* or "all sender," was laid across the two middle fingers and the other three slips upon it, inside of one another, all being then cast together. From its name and use in casting, Mr. Cushing drew a pointed comparison between the *á-thlu-a* and the ancient Mexican *atlatl* or throwing-stick.

A more popular game in Zuñi is called *Tá-shó-li-we*, "wood canes," or "arrows," and is played with staves instead of canes (Plate 8, B, C). It would appear that the wooden staves are substitutes for canes, a fact which is abundantly confirmed by the wooden lots used by adjacent tribes. Many of the latter are grooved like the cane on the inner side, and even some of the ungrooved ones

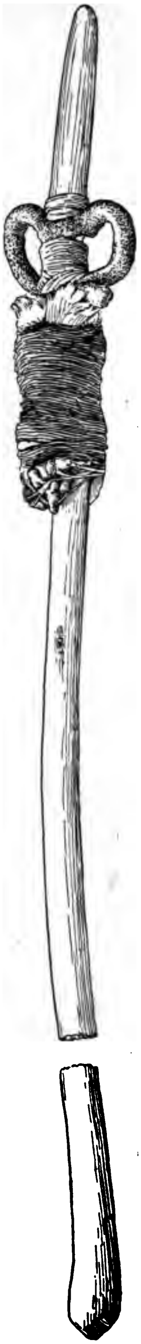

Fig. 17.—Cliff Dwellers' Atlatl or Throwing Stick. (Reproduction of original in Museum of Science and Art.)

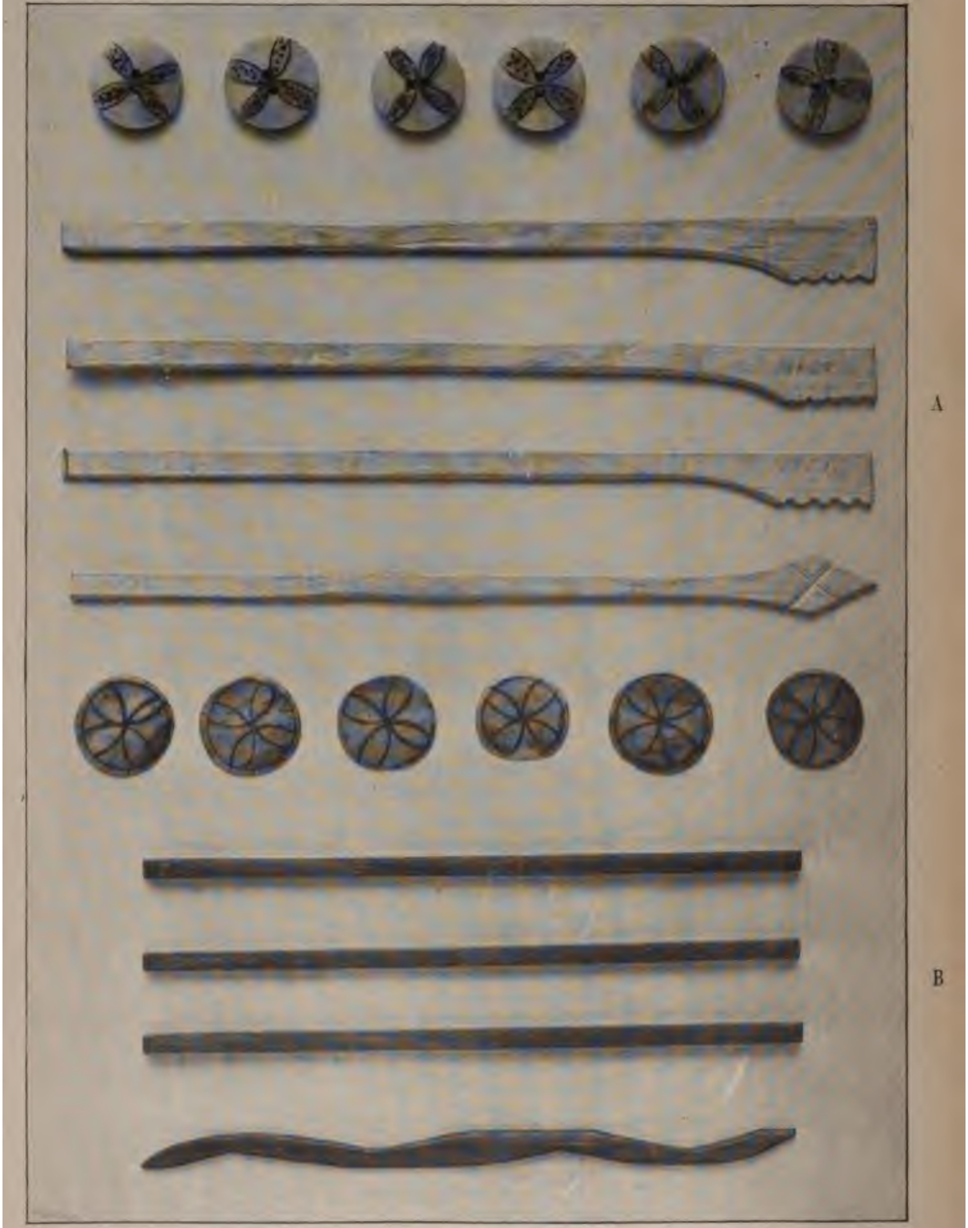

Plate 11.—Micmac and Penobscot dice games. The lot staves are replaced with disks of bone, but the three arrows and atlatl appear among the counting sticks; in the second game the atlatl is replaced by a bow. A, Micmac, Nova Scotia, Museum of Science and Art, 18,850; B, Penobscot, Maine, Museum of Science and Art, 20,951.

have a longitudinal band of red paint, as for example those of the Cocopa, simulating the hollow cane. There is abundant evidence to confirm the cane-arrow ancestry of the staves and blocks.

Scrutinizing the series of sets of gaming implements for some common peculiarity, we find that practically all of them have one of the lot pieces tied round the middle with cord or sinew, or burned or engraved with a transverse band (Plate 9, A, B). On some this mark is in the form of a cross, and suggests tieing and something tied to the stick. The peculiarity extends to the beaver-teeth dice used by the Indians of the Columbia River (Plate 9 C) and is most significantly discernible on some of the lot staves from the Southwestern Pueblos. This transversely marked or tied piece is the one that augments the throw.

It recently occurred to the speaker that the explication of this piece might lead to the discovery of the common principle or source of origin in the game. The cane slip so marked in one of the Zuñi sets (Plate 10, A) proved to be the one painted only in the middle of the inner side and designated as the *á-thlu-a*. Mr. Cushing had already suggested to me that this slip, which is placed beneath the others in throwing, corresponded with the *atlatl*. Comparison of the banded sticks with a prehistoric throwing-stick from a Cliff Dwelling in Colorado (Fig. 17) led to my conclusion that the banded sticks actually represented the *atlatl*, the cross marks perpetuating the crossed wrappings for attachment of its finger-loops. The Cliff Dweller *atlatl*

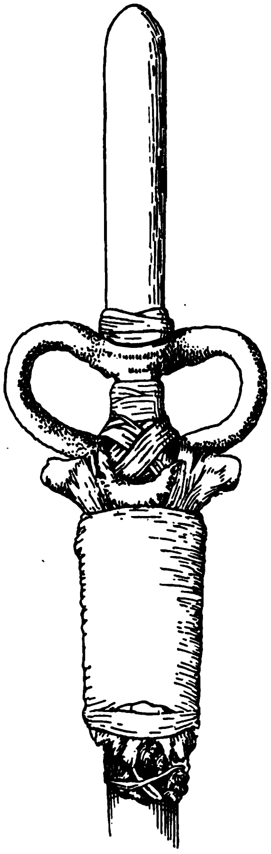

Fig. 18.—Handle of Atlatl, showing cross-wrappings for attachments of finger-loops. Probably original of tied gaming stave. Cliff Dwelling, Mancos Cañon, Colorado. Museum of Science and Art.

has finger-loops of leather, which are cross-wrapped on both sides of the shaft (Fig. 18). It is also wrapped at the finger-loops with colored yarn, now a uniform brown, but which Mr. Cushing regards as having been originally of various colors.

In a set of gaming sticks from the Tewan Pueblo of Santa Clara we find the banded stick (Plate 10, B) marked with a cross between fifteen transverse notches, which are painted green, red, yellow, and blue, the colors attributed to the world quarters. The colored notches, I assume, represent the yarn of different colors on the original throwing-stick. The fifteen notches, corresponding with a common name of the game, "Fifteen," Spanish *Quince*, probably stand for three turns around for each of the five colors.

My general conclusion as to the inter-relation of American Indian games is extended, in the case of the particular game I have described, to the belief that its various forms are not only derived, one from another, but that its place of origin may be definitely fixed in the country of the reed arrow and the *atlatl* or throwing stick—that is, in the arid region of the Southwestern United States and Northern or Central Mexico. It is in ancient Mexico that I conceive we find evidences of its highest development. What indeed is that pictured diagram in the Fejervary Codex (Plate 12), not without parallels in other manuscripts, but the counting circuit of the Four Quarters, set with colored grains on the North, West, South, and East, and in the middle the god with his three arrows and the *atlatl*, here as in Zuñi, the presiding genius of the game.

In the "Hymn of Tlaloc" we read:

> In Tlalocan, in the verdant house, they play at ball, they cast the reeds.[1]

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[1] *Rig Veda Americanus.* By Dr. Daniel G. Brinton.

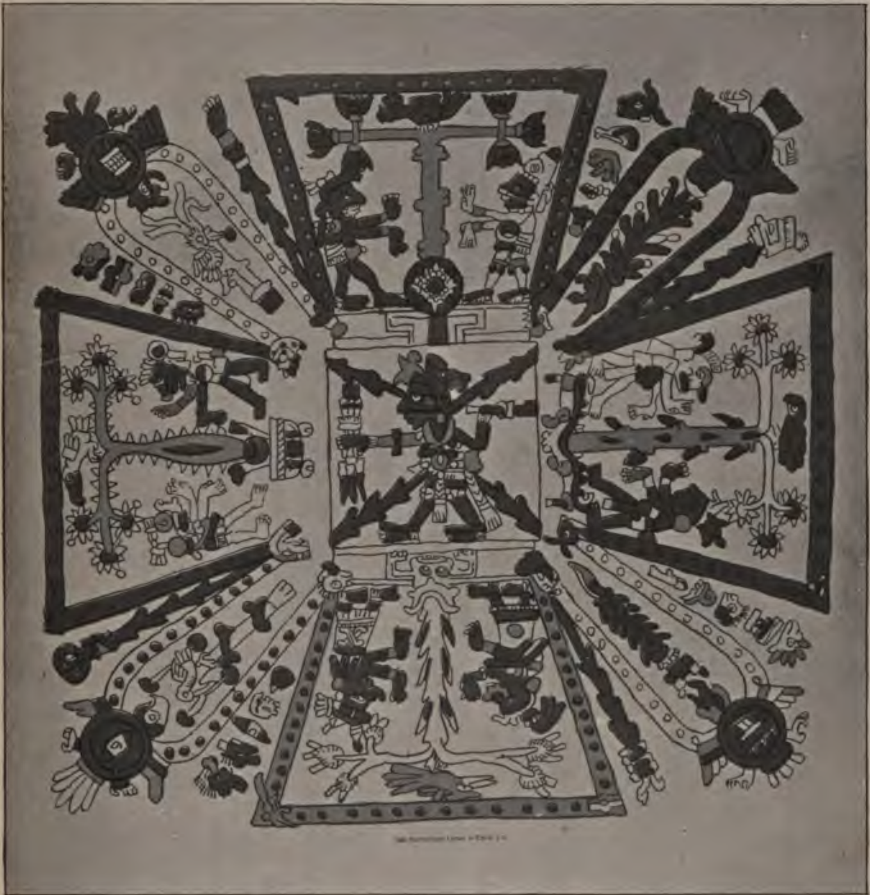

Plate 12.—Fac simile of Plate 44, Fejervary Codex, regarded by the author as representing the divinatory (gaming) counting circuit of the Four Directions, with the god of the divination with his three arrows and atlatl in the middle.

COLLECTIONS AND PUBLICATIONS.

AMERICA.

UNITED STATES (COLLINS COLLECTION).

The following collection of stone implements and pottery have been deposited by Mr. Thomas J. Collins, of Haddonfield, New Jersey. With a few minor exceptions they are surface finds, and were collected personally by the depositor.

ARIZONA.

Obsidian blade (20,822); four fragments pottery (20,823).

ALABAMA.

Eufaula.—Jasper spear head (20,818).

KENTUCKY.

Greenup (*Ohio Valley*), east towards Ashland (strip of a few miles)—Serrated blade (20,871); limonite concretion in form of small vessel (20,872); unfinished slate banner-stone (20,873); two hæmatite celts (20,874); ninety-eight flaked flint blades (20,875); cup stone (five cups) (20,888).

Harrison County (*Ohio Valley*).—Large flint blade, 5½ inches (20,876); boat-shaped stone, two perforations, Cynthiana (20,870).

NEW JERSEY.

Atlantic County.—Two grooved axes (20,796–97); six quartzite blades (20,798); two quartz blades (20,799); thirteen argillite blades (20,800); six rhyolite blades (20,801); four flint blades (20,802); six jasper blades and three oyster shells, shell heap, Nacott Creek, (20,803); tinder-box flint (20,804); ten fragments pottery (20,807); fragment steatite pot (20,813).

Burlington County.—Two grooved axes (20,790–91).

Camden County, Haddonfield.—Twenty-three pitted hammer-stones (20,698); eight rubbing stones (20,699); seventeen quartzite boulders and pebbles, partly worked (20,700); twenty-five quartzite turtle-backs and flakes (20,701); thirty-two quartzite blades (20,702); ten partly worked fragments red argillite (20,703); forty-one argillite blades (20,704); forty partly worked fragments argillite (20,705); two hundred and twenty-nine argillite blades (20,706); eighty-seven quartz pebbles and flakes (20,707); seventy-one quartz blades (20,708); ninety-two jasper pebbles and flakes (20,709); eighty-nine jasper blades (20,710, 20,717); six flint nodules (20,711); twenty-five flint flakes (20,712); fifty-nine flint blades (20,713); five chert blades (20,714); rhyolite blade (20,715); blade, hornblende andesite, (20,716); nine grooved stone axes (20,718–26); three celts (20,727–29); large unfinished celt (20,730); celt, rechipped, (20,731); four small celts (20,732–35); chipped celt (20,736); müller (20,737); five pestles (20,738–42); sixteen oblong pebbles and boulders, showing marks of use (20,743); twelve grooved pebbles (20,744); hammer head (20,745); seven stone balls, facetted by rubbing (20,746); thirteen fragments sandstone sharpening stones (20,747); eleven fragments steatite vessels (20,748); two perforated fragments steatite (20,749); four blades of banner-stones (20,750–53); longitudinal half stone tube (20,754); fragment limonite (20,755); smoky quartz crystal (20,756); fragment copper plate (20,757); fragment native copper (20,758); paint stone (?) red argillite (20,759); fragment worked phyllite (20,760); sixty-three fragments pottery (20,761); pottery cylinder (20,762); fragment clay pipe stem (20,763); large sandstone pebble work block (20,764); large quartzite pebble work block (20,765); tooth of deer (20,766); fragment mica (20,767); fragment worked phyllite with transverse scratches (20,768).

Camden County.—Pitted hammer-stone (20,769); eight quartzite pebbles and boulders showing use (20,770); five grooved axes (20,771–75); polished celt (20,776); three pestles (20,777–79); two stone balls (20,780–81); five grooved pebbles, Collingswood, (20,782); two quartzite turtle-backs (20,783); fourteen argilite blades (20,784); quartzite blade (20,785); four quartz blades (20,786); jasper blade and flake

(20,787), sixteen flint blades (20,788); large blade, gabbro, (20,789); tubular concretion, sand and limonite (20,795).

Cumberland County.—Plummet (20,805); blade of bannerstone (20,806).

Salem County.—Grooved axe (20,792); grooved axe, hafted by Mr. Collins (20,793); eleven quartz and flint blades (20,794).

OHIO.

Toronto (*Ohio Valley*), north of town.—Five pitted stones (20,836–37); rubbing stone (20,838); four round stones (20,839); three partly worked pebbles (20,840); two notched pebbles (20,841); small grooved axe (20,842); hammer-stone (20,843); large black flint blade, 5¾ inches (20,844); large white flint blade, 5¾ inches (20,845); forty-four flint blades and chips (20,846).

Toronto (*Ohio Valley*), south from near Toronto to Steubenville, five or six miles.—Two pitted stones (20,847); two discoidal stones (20,848–49); three grooved axes (20,850–52); six celts (20,853–57); white quartz celt, chipped and ground, (20,858); two hæmatite celts (20,859–60); seven hæmatite paint stones (20,861); seventy-three flint flakes (20,862); one hundred and two flint blades (20,863); nine fragments pottery (20,864); perforated pottery disk (20,865); shell bead (20,866); two bone beads (20,867–68).

Muskingum Valley.—Three flint flakes (20,869).

Vinton County (*Ohio Valley*) *McArthur.*—Müller (20,914).

PENNSYLVANIA.

Allegheny County (*Ohio Valley*), Shoustown and Leetsdale (opposite right bank).—Two pitted stones (20,889); sandstone mortar (20,890); worked pebble (20,891); nine celts (20,892–900); two unfinished celts (20,901–902); two hæmatite celts (20,903); perforated slate pendant (20,904); fragment perforated slate gorget (20,905); slate pipe (20,906); partly perforated half stone cylinder (20,907); mouth-piece clay pipe stem (20,908); fragment clay pipe stem (20,909); seven fragments pottery (20,910); three hundred and twenty chipped flint blades and flakes (20,911); flattened bullet (20,913).

Bucks County, Sellersville.—Pestle (20,541); ball, 3 inches diameter, with drilled hole (20,542); scraper (20,543); hammer-stone (20,811) and two jasper flakes (20,812), Durham jasper quarry.

Cambria County (Conemaugh Valley), Johnstown.—Flint blade (20,697).

Chester County, Green Hill.—Two stone balls (20,537); near West Chester, quartz arrow head (20,538).

Clinton County (Susquehanna Valley), Mill Hall.—Four chipped blades (20,592).

Columbia County (Susquehanna Valley), Catawissa.—Pitted hammer-stone (20,567); seven notched pebbles (20,568); grooved axe (20,569); gorget, slate, with single perforation (20,570); fragment slate gorget (20,571); three argillite turtle-backs (20,572); small scraper (20,573); two fragments pottery (20,574); ten chipped celts (20,575–84); unfinished quartzite axe (20,585); two worked argillite pebbles (20,586); unfinished celt (20,587); two fragments steatite vessel (20,588); fifty-five chipped blades (20,589).

Dauphin County (Susquehanna Valley), Herndon.—Two notched pebbles (20,596); gorget, slate with partial perforation (20,597); unfinished grooved axe (20,598); chipped celt (20,599); chipped and polished celt (20,600); two small celts, (20,601–2); pebble scraper (?) (20,603); large quartzite flake (20,604); five turtle-backs (20,605); twenty-nine chipped blades, etc. (20,606–7); jasper blade (20,608); crooked chipped blade (20,609); spear head, 8½ inches, (20,610); two spear heads (20,611); fragments of steatite pot (20,612); fourteen fragments pottery (20,613).

Dauphin County, Haldeman's Island (mouth of the Juniata).—Twenty-seven notched pebbles (20,614); grooved axe (20,615); nine unfinished grooved axes (20,616–24); polished celt (20,625); nine small celts, in part broken (20,626–34); two chipped celts (20,635–36); fourteen roughly chipped pebble celts (20,637–50); nine long pestle-like stones (20,651); fragment gouge (20,652), and fragment highly polished steatite tube, diameter, one inch (20,653); fragment steatite pipe bowl (20,654); fragment perforated banner-stone (20,655); two fragments gorgets (20,656); slick stone with cord marks (20,657); pitted hammer stone (20,658); three stone balls (20,659); six jasper blades and flakes (20,660); one hundred and thirty rhyolite blades (20,611); twenty-two rhyolite flakes and turtle-backs (20,662); five argillite blades (20,663); two quartzite blades (20,664); chert arrow head (20,665); fifty-seven blades (20,666); fifty-seven flakes and turtle backs (20,667); blade and flake (20,668); fragment chipped quartz (20,669); four fragments steatite pots (20,670); engraved pebble (20,671); twenty-four fragments pottery (20,672).

Jefferson County (*Allegheny Valley*), near Reynoldsville.—Slate gorget, two perforations, one incomplete (20,540).

Juniata County (*Susquehanna Valley*), *Mifflintown.*—Four hammer-stones (20,546); two notched pebbles (20,547); pestle (20,548): gouge (20,549); rubbing stone, round pebble, with four facets (20,550); ten chipped celts (20,551–60); slate scraper, 8½ inches (20,561); two turtle-backs, rhyolite (20,562–3); twenty-eight chipped blades (20,564–5); four fragments pottery (20,566).

Lawrence County (*Ohio Valley*), *Mahonington.*—Pitted hammer-stone (20,808); grooved pebble (20,809); seven flint blades (20,810).

Luzerne County (*Susquehanna Valley,*) *Forty Fort.*—Hammer stone (20,593); two chipped blades (20,594); ten fragments pottery (20,595).

Lycoming County (*Susquehanna Valley*), *Muncy.*—Two chipped blades (20,544); ten notched pebbles (20,545).

Montgomery County, *Phœnixville.*—Hammer-stone (20,539).

Perry County (*Susquehanna Valley*), from Duncannon to mouth of the Juniata.—Nineteen notched pebbles (20,673); three grooved axes, unfinished, (20,674–76); small celt (20,677); fragment banner-stone (20,678); two unfinished banner-stones, roughly blocked out, (20,679); three small pieces of perforated worked steatite (20,680); four fragments steatite pots (20,681); leaf-shaped blade, rhyolite, 5 inches long, (20,682); five rhyolite blades (20,683); glass bead (20,684); three pestles (20,685–87).

Somerset County.—Polished celt (20,590); thirteen chipped blades (20,591).

TENNESSEE.

Fragment pottery with basketry pattern, stone mound, (20,819); quartz arrow head, Loudon County, (20,820); small slab worked phyllite (20,821).

VIRGINIA.

Two quartzite blades (20,887).

WEST VIRGINIA.

Ravenswood (*Ohio Valley*).—Notched ball of hæmatite (20,878); hæmatite celt (20,879); hæmatite paint stone (20,880) fourteen flint blades (20,881); two fragments pottery (20,882); shell (20,883).

Wellsburg (*Ohio Valley*).—Pitted stone (20,884); hammerstone (20,885); two partly worked pebbles (20,886); celt, hafted by the depositor (20,912).

UNITED STATES (MISCELLANEOUS).

NEW MEXICO.

Mr. Carl Edelheim has presented 83 specimens of modern Pueblo pottery (20,178–260), from Acoma and Laguna, comprising miniature bowls, cups, paint cups, jars, pitchers, baskets, candlesticks, canteens, and spoons, and Mrs. Thomas A. Scott, 29 similar specimens (20,318–346) from Tesuque, Laguna, Acoma, and Santa Clara. Mrs. Scott has also presented a large water jar from Zuñi (20,352); five jars (20,347–351) from the ruins of Pajero Pinta, 36 miles north of Santa Fé; a head dress (20,363) used in the "rain dance" from Santo Domingo; a Pueblo bow drill (20,364) with chalcedony point; a miniature Navajo loom (20,365); Navajo Indian saddle (20,366); bow, bow case, quiver, and arrows (20,367) of the Jicarilla Apache and three hafted stone axes and hammers (20,368–370), probably Tewan, one of which (20,368) was made, according to Mr. Cushing, for use in dances.

PENNSYLVANIA.

The Rev. W. Boyd, of Lansdowne, Pa., has presented a flattened stone tube (20,507), 5 inches in length, from Wallace township, Chester County, Pa. (John Patterson's farm). Mr. E. T. Mack, of Nazareth, has presented a rubbing stone (20,505) and two arrow heads (20,504) from the vicinity of that town.

WYOMING.

Provost Charles C. Harrison has presented a catlinite pipe with stem (20,417) and beaded tobacco pouch (20,418), given to him by the Rev. Frederick H. Post, of Perth Amboy, N. J., to whom they were presented by Washakie, an old chief of the Shoshoni. Upon inquiring of Mr. Post for additional particulars concerning the pipe, he kindly stated that it had been sent to him in 1887 or 1888 by Washakie, through his brother, who resided for several years at Fort Washakie, Wyoming; an "eagle-wing fan" (20,497) accompanied the original gift, and this Mr. Post presented to the Museum.

After examination, Mr. Cushing states that "the fan is a true war fan. It differs from the ordinary war fan in being made not only from the right wing, but also from the neck skin and breast covers of a 'man' eagle, so as to make, as well as symbolize, the wind or breath of destruction or victory wherewith to fan the fire by which the pipe is lighted at a council of war. It should belong to the keeper of the tribal pipe, but is not an integral part of the calumet pipe unless in exceptional cases. In the absence of specific information regarding this particular example, I cannot add much more than to say that the beaded decorations, though modern, replace more ancient and highly significant forms. The plant figures should represent the tobacco flower of fire, for three black-tipped 'plumes of smoke' issue from it, while at either side are the shields of the flower, symbolic of protection. The medicine bag attached below is the turtle, also a defensive amulet; and the straight diagonally banded line at the back is the wind and 'straight trail' of life, so much referred to by Miss Fletcher."

MEXICO.

Mrs. William H. Miller has presented a pair of cut leather saddle cloths (20,157), a pair of leather breeches (20,158) worn by Dr. Charles Lukens in Mexico prior to 1820, and a beaded sash (20,159) of Indian manufacture.

CENTRAL AMERICA.

NICARAGUA.

Mr. Octavio A. Gamez, M. D. 1900, has presented a *molenillo* (20,927) used for stirring chocolate.

SOUTH AMERICA.

ARGENTINE.

Fragments of terra-cotta (20,297), and spindle-wheel (20,298), work of the Comechingones, the oldest inhabitants of the Province of Cordoba, found with rough flint arrow points at Olain, department of Punilla, Cordoba, 1895, have been presented by Prof. H. H. Giglioli.

BOLIVIA.

Dr. Thomas G. Morton has presented photographs (20,426–27) of an ancient silver image, $8\frac{3}{16}$ inches in height, representing a nude woman, with hair in double braids down back. This image, now in Dr. Morton's possession, was presented to his father, Dr. Samuel G. Morton, by Dr. Wm. A. Foster, in 1840, and is said to have been found in the ruins on an island in Lake Titicaca.

BRAZIL.

Prof. H. H. Giglioli has presented a cast of a remarkable stone axe (20,299) in the Sienna Museum, "described as Italian, but evidently from N. Brazil" (H. H. G.).

CHILI.

Prof. H. H. Giglioli has presented the following casts of rare archæological specimens in the Museo Nacional, Santiago, obtained from Prof. R. A. Philippi: Two stone labrets found at Freirina (20,300) and Coquimbo (20,301), three pipes, *cachimba*, (10,302–304), Valdivia; pan flute (20,305), Valdivia; copper mace-head (20,306), N. Chili; stone club-head (20,307), and three singular stone objects, worked fossil teeth (20,300–311), Colchagua.

ECUADOR.

Necklace of red, white, and black seeds in ornamental pattern, Zaparo Indians, Napo River (20,296), have been presented by Prof. H. H. Giglioli.

PARAGUAY.

A small netted bag (20,295) of the Angaite Indians, Chaco Boreal, has been presented by Prof. H. H. Giglioli.

POLYNESIA.

The following objects have been presented by Prof. Henry H. Giglioli:

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OTAHEITE (TAHITI).

Piece of white tappa cloth (20,279), of the best kind, collected during Captain Cook's third voyage, 1777.

MELANESIA.

The following objects have been presented by Prof. Henry H. Giglioli:

FIJI.

Large glazed terra cotta jar (20,266), Viti Levu.

CENTRAL AMERICA.

NICARAGUA.

Mr. Octavio A. Gamez, M. D. 1900, has presented a *molenillo* (20,927) used for stirring chocolate.

SOUTH AMERICA.

ARGENTINE.

Fragments of terra-cotta (20,297), and spindle-wheel (20,298), work of the Comechingones, the oldest inhabitants of the Province of Cordoba, found with rough flint arrow points at Olain, department of Punilla, Cordoba, 1895, have been presented by Prof. H. H. Giglioli.

BOLIVIA.

Dr. Thomas G. Morton has presented photographs (20,426–27) of an ancient silver image, $8\frac{3}{16}$ inches in height, representing a nude woman, with hair in double braids down back. This image, now in Dr. Morton's possession, was presented to his father, Dr. Samuel G. Morton, by Dr. Wm. A. Foster, in 1840, and is said to have been found in the ruins on an island in Lake Titicaca.

BRAZIL.

Prof. H. H. Giglioli has presented a cast of a remarkable stone axe (20,299) in the Sienna Museum, "described as Italian, but evidently from N. Brazil" (H. H. G.).

CHILI.

Prof. H. H. Giglioli has presented the following casts of rare archæological specimens in the Museo Nacional, Santiago, obtained from Prof. R. A. Philippi: Two stone labrets found at Freirina (20,300) and Coquimbo (20,301), three pipes, *cachimba*, (10,302–304), Valdivia; pan flute (20,305), Valdivia; copper mace-head (20,306), N. Chili; stone club-head (20,307), and three singular stone objects, worked fossil teeth (20,300–311), Colchagua.

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NEW CALEDONIA.

Seven toy spears (20,265), made for the chief's son, Balade. Collected in 1892 by a French missionary.

NEW GUINEA.

Woman's net bag (20,267), Taraway, Gilbert Island; fine small mat (20,268), Merat or Djamma, Tabi Island; pan flute, single series of reeds (20,269), Duau, Normanby Island; cocoanut spoon (20,270), Roro, Yule Island, southern coast; two net bags (20,271), made by the women on the coast and island in Papuan Gulf, from the villages of Wailala and Kerema; collected by Ch. Kowald, June, 1895. Grass petticoat of young woman (20,272), Guap, Schouten Islands; collected 1885. Grass petticoat of young girl (20,273), Milne Bay; collected 1890. Man's dress in two pieces of plain and two of colored bark cloth (20,413), Collingwood Bay.

SOLOMON ISLANDS.

Drinking gourd (20,261), Rubiana; banana leaf kite with tackle and spider-web bait, for fishing pike-fish (20,262), *Belone*, Rubiana 1892 (cf. Partingdon, *Ethno. Album* Pl. 197, Fig I, Manchester, 1890); pan flute (20,263), reeds in double series, Buka, R. Parkinson, 1895; fine flat mat-bag (20,264), Buka, R. Parkinson, 1895.

AUSTRALIA.

Mrs. W. H. Miller has presented a necklace (13,542) of the lower canine teeth of two species of the kangaroo, and Prof. Henry H. Giglioli the following objects:

Miro, club (20,274) of Kungalburra tribe, N. E. Queensland, length 29 inches; humming top (20,275), gourd with four perforations with spindle cemented with gum, height 6½ inches, spun on an old blanket or clear track, Queeariburra tribe, near Cairns, N. E. Queensland, collected by Bellenden Ker (V. *Journal Anthop. Inst.*, Vol. XXV, No. 3, p. 259); cast of *tea* or *buba*, huge stone axe (20,276) of Gengaji, N. E. Queensland, from an unique specimen in the Australian Museum, Sidney;

quartzite hammer-stone (20,277), Wattagoona, New South Wales, E. P. Ramsay, 1889; *yelltra,* stone slab for grinding nardoo seed (20,278), Wattagoona, New South Wales.

ASIA.

THE FAR EAST.

CHINA.

The Hon. Mayer Sulzberger has presented a book of pith paper pictures (20,423) of women playing on musical instruments; Miss Mary Ansley, an ivory cube puzzle (20,432) and an ivory bar with cord and rings puzzle (20,431) from Canton. Messrs. George and J. Edward Farnum have given a terminal tile (20,469) and a hip tile (20,468), surmounted with a lion, of yellow glazed pottery from the Yellow Temple at Peking.

JAPAN.

Mr. Edwin Swift Balch has presented a modern Japanese sword (20,925) mounted as a cane in a bark scabbard, and Messrs. George and J. Edward Farnum, two *makimono* or roll pictures (20,470–71.)

KOREA.

Messrs. George and J. Edward Farnum have presented an enamelled silver ear pick (20,500) and a pin (20,501) from Southern Korea.

THIBET.

Messrs. George and Edward Farnum have given a bundle of Lhassan incense (20,443) presented to them by the acting chief priest of Lama Miao (Dolonnor,) S. E. Mongolia. The bundle is octagonal, wrapped with a red and yellow cord, and was originally about 30 inches in length, having been broken in half in order to transport it. Large quantities of this incense are sent each year by the chief priest at Lhassa to this temple.

INDIA.

Professor H. H. Giglioli has presented five *fac similes* of the footprints of Krishna (20,294) sold as amulets to the faithful during the festivities of Jagannath at Puri, South India.

ISLAND ASIA.

NICOBAR ISLANDS.

A woman's dress (20,292) *hinong-lama-ok*, made of grass. Collected by E. H. Man, 1895, and a pair of cocoanuts, *hishoya*, (20,293), used as water holders in the central islands of the Nicobar group, from Great Nicobar, collected by M. Man in 1890, have been presented by Professor H. H. Giglioli.

AFRICA.

ABYSSINIA.

Mrs. Lucy Wharton Drexel has presented a charm (20,502) against evil eye made of two tusks of a boar united to form a crescent, used on the harness of animals, and a pair of phylacteries (20,503), collected by her in Abyssinia.

CAPETOWN.

The following Kaffir and Zulu objects have been obtained by purchase through Mr. F. Kulka: tobacco pipe, wood (20,371); tobacco pipe, antelope horn, reed stem, steatite bowl (20,384); tobacco and food bag (20,386); snuff boxes (20,372, 20,375); snuff spoon (20,378); calabash dipper (20,382); gourd vessel for beer (20,383); anklet (20,376); bangles, four (20,379–81); bead necklace (20,377); bead belt (20,380); girdle fringe (20,391); necklace, imitation lion claws (20,387); capsule (20,385); fly whisk (20,388); pillow (20,374); knob kerie (20,373); doctor's necklace of antelope horns (20,389); marimba (20,390).

Mrs. Charles F. Thomas has presented a wooden image or idol (20,424), an erect human figure, 7½ inches in height, with wrists tied across behind back.

Mr. Edwin Swift Balch has presented a Fan dagger (20,924).

EUROPE.

ITALY.

Professor H. H. Giglioli has presented a cast of a jade axe (20,312) found at Udine (Venice) from original in his collection, and a fragment of vase (20,313) found with rude flint implements at Colle Gallettí, near Chietí, Central Italy.

SPECIAL COLLECTIONS.

American History. Mrs. W. H. Miller has presented a sabre (20,316) which belonged to Lieutenant-Colonel McPherson, who commanded the Forty-Second Regiment of British and German troops at the descent on Paramus, N. J., March 24, 1780.

Mr. Charles Laubach, of Riegelsville, has deposited an engraved military powder-horn (20,482), originally belonging to Anthony Lerch, Sen., a private in Captain Christian Laubach's company of Saucon Rangers, serving during the Indian troubles in Pennsylvania in 1755-62. Miss Annie Lerch, daughter of Anthony Lerch, Jr., married John Kneight, of Durham, Pa., and brought the powder-horn to her home as a keepsake, where it remained in the garret until the decease of her son David, in 1891, when it was bought with a lot of other colonial relics by the present depositor.

Mr. Thomas J. Collins, of Haddonfield, N. J., has deposited the inkstand, sand-box, warming pan, and cane (20,516–19) of Jonas Cattell, the whipper-in of the Gloucester Fox-Hunting Club.

Fans. Mrs. Lucy Wharton Drexel has made the following additions to her collection : wooden fan painted with costumes and arms of the Swiss cantons (20,155) ; drawing by Sir Thomas Lawrence (20,156) ; Mexican—bull fighters and street scene (20,475) ; French—gilded pearl sticks, 19th century (20,476) ; Japanese — painted silk (20,479) ; Canton, China — carved sandal-wood sticks, and scenes from Chinese theatre (20,487) ; vellum fan, portrait and autograph of Joseph Jefferson, painted by William F. Kline (20,488) ; vellum fan, the Jungfrau, from

Interlacken, painted by Bierstadt (20,917); French—carved ivory sticks (20,918); three palmetto fans, Florida (20,919).

Mr. Robert O. Babbitt has presented a French fan (20,477) with gilded ivory sticks, 19th century.

Fire-making and Lighting.—Mr. Stacey Clarke, of New York City, has presented an ancient brass candlestick (20,154) from a church in Bruges; Mrs. Jacob H. Lazarus, a brass candlestick, Prussian (20,169), brass candlestick, Pompeiian (20,170), brass sconce dated 1755 (20,171), U. S. colonial candlestick (20,172), and a pair of antique brass candlesticks from Quebec (20,419), and Mr. Richard H. Day a package of tinder-box flints (20,173). These flints, which were purchased by the donor in an old shop on Second steeet, Philadelphia, in 1897, are regarded by him from their light color as probably manufactured on the continent, the Kentish flints being dark. They were imported in casks and repacked in Philadelphia. Mr. Day has also given a lard oil lamp (20,174) and a fluid lamp (20,175) from the garret of Sylvester Coulston, a blacksmith of Germantown, Philadelphia, and two pairs of brass snuffers (20,921).

Mr. W. F. Witte, of Springtown, Bucks Co., Pa., has deposited an antique lard lamp (20,429), the can (20,430) accompanying it used for melting the fat, and a pair of antique steel snuffers (20,926).

Col. Henry D. Paxson has given small pottery lamp (20,472) called *sofiayde* or "virgin lamp," used at the present day throughout Syria and Palestine for the purpose of illuminations, sometimes in long rows on the house-tops, in houses, churches, and on graves of Mohammedans at night. Olive oil is burned in it, and a wick of twisted cotton cloth. A small stick about the size of a match goes with each lamp to shape the wick. Col. Paxson has also given two antique fluid lamps of Britannia ware, one (20,491) of the acorn pattern, the other (20,402) a socket lamp intended to be inserted in a candlestick. Also an old match-box (20,493). The above were purchased by the donor at an old store on Callowhill street, Philadelphia.

Mr. Charles Laubach has presented an old iron candlestick (20,481), and Mrs. Mary Potter, of Bethlehem, a glass fluid lamp (20,483).

Mr. Charles Laubach has presented four iron stove plates: Side plate, 26x28 inches, 1756, described below (20,133). Side plate, with orifice for door, 26x32½ inches; "R. Backhouse, Durham, 1785" (20,135). Side plate, with door, 26x35 inches; "Valentine Eckert, Sally Ann Furnace, E Pluribus Unum" (20,132). End plate, 15x26 inches; decorated with vase, with tulips; no inscription or date (20,134).

In a communication accompanying the gift, read at a meeting of the Numismatic and Antiquarian Society of Philadelphia, October 7, 1897, he says:

"Iron stoves were unknown before 1678, when Prince Rupert, of England, attempted to convert a fireplace into a furnace. This was the first attempt to force smoke back over the fire and create heat for warming apartments by the aid of iron. Early in the eighteenth century, about 1710, Count Polignac, of France, made an attempt to convert an ordinary fireplace into a heating apparatus by simply constructing a fireplace with an iron back, hearth, and jambs. The result was only a slight saving of heat. In 1716 Dr. Desaugliers, of London, succeeded in improving the Polignac fireplace so that it could be used for burning coal.

"The first attempt at manufacturing heating apparatus at Durham, Pa., was in 1741, by the Durham Furnace Company. The firm consisted of George Taylor (later one of the signers of the Declaration of Independence), James Logan and James Morgan, ironmasters (the latter being the father of General Daniel Morgan, the hero of Cowpens).

"The 1741, stove pattern was called the 'Adam and Eve,' from its embellishment. It was in the form of a box, two feet square, without side or oven doors, having merely one door in front to supply it with fuel and draft, and a hole on top to allow the escape of smoke. The stove was designed by its inventor to instruct as well as to supply comfort, having inscribed, in raised characters, the date 1741, surrounded with fine scroll work. Above this were raised figures representing Adam and Eve, the serpent, several fruit trees, and a variety of animals in the background. In 1745 Franklin invented the famous stove which bears his name. This pattern continued to be cast at the Durham Furnace until 1774, and probably later.

"In 1756, when the furnace was leased and operated by Captain Flowers and James Morgan, a new design of stove was invented by the firm and cast at the furnace. The side plates were highly embellished with scroll work and the following inscription:

"'DIS. IST. DAS. JAHR. DA. 1756.'

"In 1774, when George Taylor, Samuel Williams and James Morgan were members of the firm operating the Durham Furnace, a new model of a stove was constructed with the inscription: 'Durham Furnace, 1774.' This was surrounded by a wealth of fine scroll work. A portion of a stove with the above inscription and the date thereon was for many years placed in a conspicuous position in front of the Easton, Pa., post-office.

"In 1779 Richard Backhouse became proprietor of the Durham Iron Works. During the Revolution he supplied Washington's army with shot, cannon-balls, canister, and grape. At the close of the war he commenced the manufacture of stills, steel wagon springs, stoves and stovepipes, in addition to pig and bar iron. In 1785 he invented an improved ten-plate stove, constructed with stovepipe attachment, as at that time stovepipe was considered a luxury. In 1789 the Valentine Eckert pattern stove was largely cast here and at the Sally Ann Furnace, near Allentown, Pa. Captain Valentine Eckert, of Revolutionary fame, had in the year 1789 a neat model of a stove constructed, which was largely cast at Durham and at the Allentown and Reading Furnace. The stove bore the inscription, 'Valentine Eckert, Sally Ann Furnace,' scroll work and the American eagle carrying the motto, 'E Pluribus Unum,' in its mouth. It is curious to note, according to the Durham Furnace ledgers, that the various stove patterns—Adam and Eve, 1741; Franklin, 1745; Philadelphia, 1755; Captain Flowers and Morgan, 1756; George Taylor, 1774; Mount Pleasant, 1780; Richard Backhouse, 1785; Captain Eckert, 1789, and Pettibone, 1791—were frequently exchanged among the various furnaces and forges in Pennsylvania and New Jersey, and cast at designated furnaces to supply the needs and tastes of the inhabitants of the surrounding regions."

Games.—Professor H. H. Giglioli has presented an old wooden board (20,291) in two parts for the game of *Gabuttá* (Mancala), collected by General L. Bisesti in Adigrat in Tigré, N. Abyssinia, May, 1896. This specimen was the property of Res Sebath, one of the rebel chiefs. This board is identical with that figured by Bent (*Sacred City of the Ethiopians*), and reproduced by Culin (*Mancala, the National Game of Africa*). Reprt. U. S. N. M., 1894.

Mr. M. F. Lobo has presented an old wooden board (20,152) for the game of *warry* (Mancala) from Barbados, W. I.

This board, made of a plank 2¼ inches thick, 6 inches wide, and 20 inches in length, has two rows each of six hemispheric holes. The collector, E. S. Daniels, of Barbados, gives the following account of the play:

"This game is played by two persons with forty-eight counters (generally round). At starting, the first player, who has been agreed upon, places a counter in each pocket in rotation, going from left to right, until his twenty-four counters are exhausted. There are then two counters in each pocket. The second player proceeds in the same manner, making four counters in each pocket. The first player now takes the four counters from any of the four pockets nearest the right side of his board, and places one of them in each of four successive holes, commencing with the one immediately next the one from which he took the counters and ending on his opponent's side. The second player does likewise, and the game proceeds in the same manner, the players choosing the pocket from which they start. If at any play a counter falling on the opponent's side makes two or three, it wins them, or if a play end in a pocket with one or two in it, thus completing two or three, these can also be taken, as well as any that may come before this hole in succession, provided always that there are two or three in each of them. Four, called a 'house,' cannot be taken. The game is decided by winning the greater number of counters.

"Players must always end their first move on the opponent's side, but afterward this is optional.

"Players can only capture counters on the opponent's side.

"If two or one remain on either side at the close of a game, it is a draw.

"Counters must be played one at a time, and one in each hole.

"The game is supposed to have been introduced many years ago by some African soldiers who were enlisted in one of the West India regiments. The game here is chiefly played by the porters and boatmen on the wharf. It is said to be very intricate."

It would appear from a reference in Bent's *Ruined Cities of Mashonaland* that the name in Barbados, *warry* (wari), was one common on the west coast of Africa.

Mr. Thos. F. Dozier, of Santa Clara, N. M., has presented a set of staves (20,153) for the Tewan game of *Tugĭ-e-pfĕ* (Spanish, *Pastore*) as played at Santa Clara. One stave of this set, having notches and crossed marks, is represented in Plate 10, B.

A set of beaver teeth (20,930), Plate 9, C, used in gaming by the Indians of Washington, have been obtained by purchase through the kindness of the Rev. Myron Eells.

Mr. George E. Starr has presented a set of implements (20,575) for the bowl game of the Tobique (Micmac) Indians of New Brunswick. It consists of a wooden platter 10½ inches in diameter, six bone disks marked with red on one side, and counting sticks, comprising fifty plain and five larger carved sticks.

A set of implements (20,951) for the bowl game of the Penobscot Indians of Maine, Plate 11, B, have been obtained by purchase through Mr. Cushing.

The United States Playing Card Company, of Cincinnati, Ohio, has presented one hundred and fifty sample packs illustrating all varieties and qualities of playing cards manufactured by them, together with five sample books of their playing cards.

Mr. Charles J. Wood has presented a pack of French fortune-telling cards (20,137), *Jeu de Cartes Oracles*, David, Paris, purchased on the Boulevard, in Paris, 1897.

Mr. Clarence B. Moore has presented four pottery checkers (?) (20,160–62), from Beaufort Co., S. C., and the Georgia coast.

Numismatics.—The following important additions have been made to the collection of gold and silver coins recently deposited in the Museum :

Gold : $2.50, 1833 ; $10, 1849.

$20, 1861, Clark Gruber & Co., Denver, Col.

Silver : Quarter dollar, 1796. Two varieties, one proof showing file marks on bust.

The Rev. Charles J. Wood has presented U. S. copper cents of 1846 and 1797 (20,163–4).

There are practically no copper pieces in the Museum's series of United States coins, and it is desired to complete the series.

Mr. Curwen Stoddard has presented a one-shilling note (20,177) of the Hudson's Bay Company, 1846, and Mr. Victor D. Brenner, of New York City, his bronze medal of Chauncey M. Depew (20,435) and his silver medal of Nansen (20,434).

LIBRARY.

The following are among the most important acquisitions since the last issue of the BULLETIN :

Compte-Rendus of the Imperial Russian Archæological Commission, 4 vols., 1893 to 1896.

Matériaux pour servir à l' Archæologie de la Russia, publiés par la Commission Impérial Archéologique, Nos. 13–20. Eight vols., 1893 to 1896.

Gifts of the *Imperial Russian Archæological Commission.*

Memoirs of the Historical and Antiquarian Society of Odessa, Russia : Vol. II, 1850 ; Vol. III, 1852 ; Vol. IV, 1858–1860 ; Vol. V, 1863 ; Vol. VI, 1867 ; Vol. VII, 1868–1872 ; Vol. VIII, 1872 ; Vol. IX, 1875 ; Vol. X, 1877 ; Vol. XI, 1879 ; Vol. XII, 1881 ; Vol. XIII, 1883 ; Vol. XIV, 1888 ; Vol. XV, 1889 ; Vol. XVI, 1893 ; Vol. XVII, 1894 ; Vol. XVIII, 1895 ; Vol. XIX, 1896.

Gift of the *Society.*

Antiquarisk Tidskrift för Sverige, Vols. II–XVI, 1869, 1895.

Kongl. Vitterhets Historie och Antiquitets Akademiens Månadsblad, Nos. 16–22, 1887–1893.

Gifts of the *Royal Academy of Belles-Lettres, History and Antiquities of Stockholm.*

Pérou et Bolivia par Charles Wiener. Paris, 1880.

By Purchase.

PUBLICATIONS.

The Department of Archæology and Palæontology has just published, through the liberality of Eckley B. Coxe, Jr., Esq., another volume of the series of the Babylonian Expedition of the University of Pennsylvania; Series A: Cuneiform Texts edited by H. V. Hilprecht. This volume (IX), pp. 90, Plates 72, xx, quarto, consists of "Business documents of Murashû Sons of Nippur, dated in the reign of Artaxerxes I (464–424 B. C.)," by Prof. H. V. Hilprecht and the Rev. A. T. Clay.

The price of the work is $6.00.

EXCHANGES.

An exchange of publications has been made with the following societies and institutions since the last issue:

Historical and Antiquarian Society of Odessa, Russia.

Royal Academy of Belles-Lettres, History and Antiquities of Stockholm.

LECTURES.

The following lectures, with demonstrations by means of objects in the Museum, have been delivered in the American Hall on Wednesday afternoons at 4 o'clock.

January 5th. Mr. Frank Hamilton Cushing,* "Gorgets, Bird- and Banner-Stones," Pipes and Calumets.

January 12th. Dr. Daniel G. Brinton, "How to Study Stone Implements."

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* In consequence of Mr. Cushing's illness, his notes and illustrations were presented by Mr. Culin.

January 19th. Dr. Max Uhle, "The Peruvian Mummy."

January 26th. Mr. Stewart Culin, "Lights and Lighting."

February 2d. Dr. Daniel G. Brinton, "Primitive Uses of Bone."

February 9th. Prof. Amos P. Brown, "Jade and Green Stones in Asia and America."

February 16th. Mr. Stewart Culin, "Charms and Amulets."

February 23d. Dr. John W. Harshberger, "The Use of Plants Among the Ancient Peruvians."

March 2d. Mrs. Talcott Williams, "Tattooing in Morocco."

March 9th. Dr. Daniel G. Brinton, "European Archæology."

March 16th. Mr. Stewart Culin, "Engraved Powder Horns."

March 23d. Mr. A. E. Outerbridge, Jr., "Curiosities of American Coinage."

March 30th. Dr. Max Uhle, "Coca and Tobacco in South America."

April 6th. Mr. Stewart Culin, "Fraudulent and Counterfeit Antiquities." *

April 13th. Mr. H. Kent Day, "Monumental Brasses."

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* Postponed until next season.

JADE AND SIMILAR GREEN STONES.[1]

BY PROF. AMOS P. BROWN.

THE name jade may be properly applied to several mineral species, all of which have a more or less greenish color, are as hard or harder than steel, and possess a compact and tough texture. The name is also sometimes improperly extended to include other greenish stones of the same general appearance, notably several varieties of serpentine. The stones now called jade were formerly grouped under the head of jasper and were included with the green jaspers. The names jade and lapis nephriticus, both of which were used to designate these stones by the older mineralogists, came into use about three hundred years ago. Agricola,[2] in his *De Natura Fossilium*, does not make use of either term, although he undoubtedly alludes to jade under "jasper" when he describes a variety which in color "is like to gray fat, or greenish, sprinkled with milky," or again as "like gray-green fat (*glauco pingui similis*)"; both of which descriptions almost certainly allude to Oriental jade, and particularly so as he describes the mineral as coming from "India." Conrad Gesner[3] (1566) does not use the names jade or lapis nephriticus, although he probably alludes to jade under the greenish "jaspers," which he states are particularly valuable for amulets, and as cures for certain kinds of sickness.

Aldrovandus[4] (1642) speaks of the stone under the name of "lapis nephriticus, commonly called Isiada or Osiada, from ischiada or sciatica, and therefore called by the Spanish *piedra de la yjada*." It seems probable that the name "jade" was first used for the American mineral, and that it is derived from the Spanish as above, the Spaniards being the first to bring

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[1] A lecture delivered in the Museum of Science and Art, University of Pennsylvania, February 9th, 1898.

[2] Georgius Agricola. *De Natura Fossilium.* Basel, 1546.

[3] Conrad Gesner. *De Omne Rerum Fossilium genere, Gemmis, Lapidibus, etc.*, 1566.

[4] Ulysses Aldrovandus. *Musei metallici.* Bologna, 1642.

American jade to Europe. Thus Caesius[1] (1686) speaks of jade as "lapis nephriticus, which was brought a few years ago from New Spain, it is a greenish stone, mixed with milky," etc.

At the time of the publication of Haüy's[2] *Mineralogy*, two species of jade were distinguished, which he calls *jade nephritique* and *jade de Saussure*. The first of these includes the present species nephrite and jadeite; the second is the so-called saussurite. Haüy expressly excludes serpentine from the jades, and this distinction seems to date from early times. Our present name nephrite was adopted by Werner in 1780, and the mineral jadeite was separated from nephrite on chemical grounds in 1863, this new name being proposed by Damour. Jade proper may be either nephrite or jadeite, but saussurite has often been called jade and is, for example, the "jade" of the Swiss lake dwellers in large part.

Nephrite is a silicate of calcium and magnesium, of the composition of the minerals called tremolite and actinolite. It is generally light colored, yellowish to grayish green, the color depending upon a small percentage of iron, which is higher in the darker varieties or those which approach the composition of actinolite. It is harder than steel and has a specific gravity of about 3. The structure of nephrite can only be made out when it is examined with a microscope. When seen in section, in polarized light, the mineral shows a felted mass of fibres, interlacing in every direction, looking much as the compact massive tremolite or asbestos appears to the naked eye.

Jadeite is a silicate of sodium and aluminium, also containing a little iron which gives it a greenish color. In hardness and structure it is, as a rule, precisely similar to nephrite, but has a somewhat higher specific gravity, being about 3.5. It may be distinguished from nephrite by chemical analysis or by its behavior toward polarized light. Of the two, nephrite is much more common and more widely distributed. Saussurite, the third mineral known as jade, is a mixture, being mainly feldspar, which by alteration has become penetrated by other minerals such as zoisite, epidote, hornblende, etc. In hardness it resembles the other jades, being harder than steel; its specific gravity is above 3. Its structure, as seen with the microscope, is very different from that of the other two, being entirely granular, and not a felted mass of crystals. The original saussurite was obtained from the vicinity of Lake Geneva by the elder De Saussure. Haüy distinguishes between the lustre of the polished *jade nephritique* and *jade de Saussure;* the former he calls greasy, the latter he states takes a perfect polish; and it is to be noted that nephrite and jadeite when polished do generally show a greasy lustre. These latter stones when of a strong green color often show irregular spots of white or a lighter green, and even the dull greenish gray specimens of nephrite and jadeite generally have a mottled appearance. Saussurite does not show this mottling as a rule. Owing to their structure, nephrite and jadeite are admirably adapted for making cutting instruments, but saussurite is more brittle, and while it would take a good edge, would readily chip.

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[1] Bernardus Caesius. *Mineralogia, Sive Naturalis Philosophiæ Thesauri.* 1686.

[2] *Traite de Mineralogie* par le Cen. Haüy. Paris, 1801.

The serpentines which could be mistaken for jade are all softer than steel, but otherwise closely resemble jade in color, lustre, and texture. The microscopic structure of serpentine is very close to that of jade. The precious serpentine is generally quite soft; the harder compact varieties that resemble jade are grouped under the name of bowenite. The original bowenite came from Connecticut and was discovered in 1850 by Bowen, who described it as *nephrite;* but it was subsequently shown to be a variety of serpentine and was named after the discoverer. A specimen of Chinese "jade" in the University Mineralogical Museum, brought from China and presented by Mr. Benj. Smith Lyman, proves on analysis to be bowenite. These hard serpentines were generally distinguished from jade by the earlier naturalists, at least so far as we can determine, and they should not, I think, be confounded with jade proper; for although it may have happened that primitive peoples have used either indifferently in certain cases, it is highly probable that they generally recognized a distinction. While jade implements are very plentifully found among many aborigines, worked serpentine that could be confounded with jade is rare.

As already noted, jade was brought to Europe by the Spanish conquerors of Central America and Mexico. Spain itself is set down as a source of jade, probably from its distribution thence over Europe. With the exception of the jade reported from the Jade Mountains of Alaska by Stoney & Clarke,[1] the jade-bearing rocks of America have not yet been discovered. The source from which it is usually obtained from aboriginal people (as illustrated by the specimens from Costa Rica, exhibited in the Museum for example) was the rolled pebbles of the streams and gravel deposits. This source is no doubt that from which the Mexican and Alaskan jade was obtained by the natives, and the same is equally true of the jade from Eastern Siberia. Jade is found *in situ* in parts of Western Turkestan and Eastern Burma, where it is worked by building fires against the cliffs, an extremely precarious method of mining, and attended by very high mortality. Parts of Persia and other localities in Southern Asia furnish jade, and in several islands of the Pacific, notably in New Zealand, jade is obtained. In New Zealand the jade is *in situ*, occurring in the mountains of the southern island. The jade sometimes used in jewelry is generally classified as "Oriental," or Chinese jade, and "Oceanic," or New Zealand jade.

Among primitive peoples the uses of jade are various. Its peculiar toughness and hardness adapt it for use as a cutting tool, as the celt and its various modifications—the chisel, the adze, etc.; but no doubt on account of some especial virtue assigned to it, such jade implements were often ceremonial only. Serpentine was occasionally used in the same way. Jade was also commonly used for ornament, as among the New Zealanders, for example, where carved jades representing the human figure were formerly largely worn. Probably from this use for ornaments arose its employment as a material for amulets, which is quite universal over Southern Asia, and was alluded to by the early writers, who included jade under jasper. Thus we find in Gesner that amulets of green "jasper," mottled with white, were reputed to have extraordinary powers in protecting the wearer from death by poisoning, and he states that this use was universal throughout the East. Even in the time of Pliny this use seems to have been common.

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[1] Clarke & Merrill. *Proc. U. S. Nat. Mus.*, 1888, Vol. XI, p. 115, *et. seq.*

The "medicinal" use of jade in Europe for the cure of sciatica and kidney troubles seems to date from about 1600, and apparently American jade was regarded as most efficacious. Indeed, we find it stated that this use of the stone was taught to the Spanish by the Indians of Central America and Mexico, and was communicated by the Spanish to the rest of Europe. Amulets of "green jasper," probably jade in part, had been in use in early times for the cure of sickness, and are recommended by Galen for indigestion and other stomach troubles. As a "medicine" the jades were cut into various shapes, especially long pendants, "beaks of birds," and were worn suspended by a ribbon about the neck. They seem to have been in common use in Europe and this country less than a century ago.

The working of jade into the forms in which we find it, probably presented considerable difficulty to aboriginal people, owing to its hardness and toughness. It would appear that it had to be worn into shape by rubbing rather than by pecking. The means employed by the New Zealanders are represented by the specimens of jade-working tools in the Museum. These comprise sandstone blocks to be held between the feet, on which the rough shaping is effected by rubbing the object on the sandstone; and various softer and finer stones for shaping the designs and polishing. The cutting, as practiced by the Costa Rica natives, was probably effected in the same way, no evidence of pecking appearing on the specimens, while rubbing and grinding marks are plentiful. The well-known Chinese jade carvings show the material cut into elaborate and intricate designs only equaled by the ivory carving of the same people. These Chinese jade carvings are highly prized. Excellent examples of them are to be seen in the Sommerville collection of engraved gems in the Museum.

Jade being such a valuable material, was naturally imitated. The Chinese have numerous glass imitations, and their gray celadon bowls were doubtless intended as copies of jade vessels.

The use of serpentine for ceremonial implements may perhaps be considered as an imitation of jade implements.

The Costa Rica collection now displayed in the Museum is probably the best assemblage of worked jade ever brought together. It consists (as pointed out by Mr. Cushing) of various modifications of the axe or celt, this being shown entire or more often halved by being cut in two down the centre, or even quartered by again dividing the half along its length by a second cut at right angles to the first. This cutting has evidently been done by a cord, probably in a bow, with some quartz sand as the cutting agent. Each of these halved axes shows a central line of fracture running the length of the blade, showing that it was sawed from opposite sides nearly to the middle and then broken. This side of the halved axe is not polished and the central broken section seems to have been purposely retained. A pebble in the collection which has two partly-worked cuts indicates the source from which the material was obtained, as well as the method of working it. Some of the forms in this collection represent the double-bladed axe, and many are carved and ornamented by representations of the human figure. Most of them are perforated by one or two holes, for suspension about the neck probably. Other materials besides jade are represented, as a light greenish anorthosite, which has much the physical character of saussurite. Among these jades the colors range from light greenish to darker green or bluish green, mottled with white, or clear green; the darker shades run into grays and almost to black. While analysis of Mexican and Central American jades show both nephrite and jadeite, the specimens in this collection which were examined were found to be jadeite.

THE USES OF PLANTS AMONG THE ANCIENT PERUVIANS.[1]

BY JOHN W. HARSHBERGER.

The spade of the archæologist, in laying bare the ruined edifices and temples in various lands, has opened up a vast field of inquiry to students in all departments of science. The antiquarian is interested in the customs and habits of prehistoric peoples; the architect finds much to instruct him in the buildings of antiquity; the zoologist and ethnologist, much in the animal and the human remains; the botanist, in the plant remains; and the metallurgist, in the tools and implements of the primitive workmen. No department of science has been so enriched, as the botanical. The discovery of plant remains in the graves, sepulchres, and temples has thrown a flood of light on the origin of many of our most useful and most generally cultivated plants. The deductions regarding the early geographical habitat of a species, as drawn from archæology, must be corroborated by history, paleontology, philology, and botany. All of these sciences are essential to an ethno-botanical research. The identification of vegetable remains, especially of woods, is an extremely difficult one. The student should be extremely careful in such identifications, because time and weather have obliterated many of the characters upon which a botanist depends for the recognition of species, such as color, pubescence, and form. The aboriginal races, in constructing various utensils of wood, fibre, or bone, have so modified the raw material as to make it almost impossible to determine botanically its source. With these preliminary remarks, I wish to draw attention to the use of plants among the ancient Peruvians.

MAIZE (*Zea Mays*).—Maize is a native of the highlands of Mexico, where it grows wild in the form of a closely related plant, *Euchlæna mexicana*, called Teosinthe or Cafè de Tabasco. The proof of this origin lies in the widespread use of the plant throughout Mexico, and in a philological comparison of the names for maize in the various Indian languages. The plant can be hybridized with teosinthe, showing its relationship, if not its specific identity, with that plant. Originally kernels of maize were small and sharp-pointed, and the ears narrow and short. Upon comparing the Peruvian ears and kernels, of a rich chocolate-brown color through exposure to the atmosphere, we find that they are large; the grains, although sharp-pointed, are much fuller and larger than the (wild) Mexican forms, and the rows of grains are usually arranged in a spiral fashion. The culture of maize must have reached a comparatively high plane in Peru, because the importance of the crop was fully appreciated, and great care was exercised in its cultivation. We are not surprised, therefore, that the plant was reverently looked upon by the Incas, who, if the stories told by the Spanish Fathers are true,—and we have no reason to doubt them all,—corn was used as a sacred plant in many of their religious rites and ceremonies.

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[1] A lecture delivered in the Museum of Science and Art, University of Pennsylvania, February 23d, 1898.

Peanut (*Arachis hypogœa*).—A controversial warfare has been waged as to the original home of this plant. Did it come from America, Africa, or Asia? De Candolle, after presenting the evidence offered by the argumentators on the several sides of the question, concludes in favor of an American origin. The strongest proofs of an American origin are botanical and archæological. The species of the genus *Arachis* to which the cultivated species, *Arachis hypogœa,* belongs are all American. There are six other species described by botanists, all found in Brazil and outlying regions—*Arachis glabrata, marginata, prostrata, pusilla, tuberosa* and *villosa.* That the cultivated peanut has never been found wild indicates that it has been derived, probably by selection and cultivation, from one of the other species mentioned above. Another proof of the South American origin of the peanut, ground nut, pindar, or goober, as it is variously called, is the discovery of large quantities of the underground pods by Dr. Uhle at Pachacamac, Peru. These pods differ considerably from those ordinarily sold in the markets of Philadelphia, and which come from Virginia. The Peruvian ones are usually longer, more slender, and with sharp, recurved apices. The sutures are more prominent, and the surface is raised in elevations or protuberances by the seeds within—a feature not usually associated with the ordinary cultivated ones at the present day. The pods are about of the same size as the ones sold to-day, indicating that the cultivation of the plant had been practiced extensively and had reached a high plane of development in Peru.

SWEET POTATO (*Ipomœa batatas*).—Sweet potatoes in a well-preserved state are also included in the collection of plant remains made by Dr. Uhle. They are slightly smaller than the medium-sized ones sold at grocery stores in Philadelphia, but not noticeably so. In one instance, a diseased specimen was seen, the diseased spots much in appearance like those caused by the black-rot fungus, *Ceratocystis fimbriata* Ell & Hals., although it would be hazardous to make a positive statement by the mycelium alone.

POTATO (*Solanum tuberosum*).—Potatoes are also included in the collection. They are usually small, about an inch in diameter, and are much like the tubers of the wild plants found by the writer in the mountains of Mexico, at an elevation of 10,000 feet, and which occur from the United States to Chili along the Cordilleras. The size of the potatoes would argue that the Indians of Peru derived their supply from the wild plants of the mountains, as any primitive people might do, but Dr. Uhle informs me that it is a custom among the Andean Indians to prepare their potatoes, which are as large as our own cultivated forms, by a special preservative process, which much reduces their size. However this may be, it is not at all unlikely that the culture of potatoes has been much improved since the discovery, by contact with white men. I, therefore, still maintain that the appearance of the tubers in the collection, if prehistoric, would indicate that the ancient Indians cultivated the potato to a very small extent, and derived their chief supply from the wild plants of the region. The silence of the early travelers, who have written on the plants of Mexico and North America concerning the potato, indicates that the cultivation of the potato in prehistoric America was confined to the western coast tribes of South America.

COCA (*Erythroxylon coca*). The leaves of the coca were used by the prehistoric Indians much in the same way as the Indians of the present use them. It is well known that the alkaloid principle, cocaine, prevents tissue waste during exertion and decreases the exhaustion of laborers and travelers in the mountainous regions of the Andes. After partaking of their morning meal, the Indians stuff a loose handful of leaves into their mouths with a little calcined lime, which assists the saliva in the liberation of the alkaloid. The collection of archæological specimens from Peru shows a number of ellipsoidal pellets of lime, 3 inches long and 1½ thick, hardened and cracked by drying, carried by the Indians on their mountainous journeys, together with cloth bags, 4 inches by 3 inches, for holding the leaves. If the specimens are prehistoric, the finding of these would corroborate the statement of the early Spanish writers, who mention the use of the plant by the Indians at the time of the Conquest.

SPECIAL EXHIBITION.

An exhibition of pictures of engraved powder-horns was held in the American Hall, February 20th to April 11th. These pictures were executed in water colors by Mr. Rufus A. Grider, of Canajoharie, N. Y., by whom they were loaned to the Museum. The horns were represented in their natural size and colors. Each was carefully labeled with the name of its present owner and location, together with many interesting historical details; the value of the collections being greatly enhanced by portraits, landscapes, maps, tavern-signs, etc., which were incorporated in the pictures. The collection, which was accompanied by a detailed catalogue, embraced 502 specimens classified as follows:

French War,	212
Revolution,	158
War of 1812,	12
Mexican War,	1
Hunting,	38
Wild Indians,	21
Foreign,	60
	502

The following notes have been extracted from the introduction by Mr. Grider to his catalogue:

"The use of horns of animals for carrying gunpowder was introduced into America from Europe. The custom has there been traced back some three hundred and fifty years, and its precise antiquity is unknown. A curved horn was particularly adapted for conveying gunpowder. Horns are easily and cheaply obtained, are light in weight, quickly prepared, are very strong, and neither rust, mold, or decay. If carefully filled the powder will keep dry, although exposed to the rain for days, and they can be floated on water without harm to the contents, a quality of great importance when an army had to ford streams of water.

The ends were securely fastened to cord or strap, worn under the left arm and over the right shoulder, the curved horn fitting the body of the wearer.

"The soldier, carrying the horn on his left side, when loading, drew out the stopper with his teeth, poured the powder into his right hand, returned the stopper from his mouth to the horn, let it drop in its place, put the powder into the gun barrel held by his upper left arm, and so on until loading was completed."

The oldest American-made horn in the collection was made in Schenectady, the "Van Antwerpen." It is dated 1683, its age being 215 years. It escaped destruction when Schenectady was burned in 1690, being on a farm in the vicinity.

During Colonial and Revolutionary times, a soldier ordered into service was required to come provided with four articles —gun, knapsack, blanket, and powder-horn. The Government furnished the rest.

It appears as if a military order required every powder-horn to be marked, that they could be returned quickly to their owners when filled from the powder wagon. From simple initials and names, dates and incidents, etc., elaborate ornamentation resulted, until it became fashionable to wear a finely-colored and decorated powder-horn.

Many in this collection show that soldiers or comrades did the decorating, but professional engravers existed who executed fine work, as may be seen from evidence afforded by the horns. It appears that they kept them on hand for sale, some being provided with a place, yet blank, for the name.

John Bush was, perhaps, the most skillful in lettering and ornamentation; Samuel Moore, of Poughkeepsie, N. Y., engraved many; and Eliphalet Stearns was another professional engraver. Such men were probably watchmakers and silversmiths, these two trades being formerly united.

When horns were fresh, the inside pith was removed by soaking and boiling in water. They were then scraped and cleaned and fitted with a wooden end. The points were shortened by sawing off, and bored to secure an opening. They were then polished and engraved. Rude engraving may have been done by a pocket knife, but that method fractured the surface.

Some are marked by pricking with a needle, but the best work was done with a graver, the outlines being traced first with a lead pencil. All those made by professionals were given a bath in some yellow or orange dye, which imparted an amber color. The lines were rubbed with wet or dry brown colors. The process ended by polishing with emery and oil. Sometimes vermilion was used to color prominent features, as forts. The yellow dye was enduring, water and soap having no effect upon it. The materials used have not been ascertained.

When an officer gained the admiration of his command, expression was sometimes given by procuring for him a finely-engraved powder-horn.

The horns decorated during the earlier French wars, say from 1730 to 1745, when the fighting was principally in the New England States, are plain compared with those of the later French wars, 1755 to 1760. During this period the finest work was done, surpassing that of the Revolutionary period. The British coat-of-arms was made a prominent feature, covering a large space of the horn surface.

During the early French wars the contest was for the possession of the mouth of the St. Lawrence River and the great fortress of Louisburg, which commanded it. In 1755, when the last French war began, the British held that point, and their object was to dispossess the French of every fort south of the St. Lawrence River, and drive them out of Canada. That policy caused the fighting to shift into Pennsylvania and New York, principally into New York. The interior of these States was at that time a comparative wilderness, the routes of travel being almost unknown. A new feature then appeared on soldiers' powder-horns, a map of the territory where the contest for mastery was carried on, showing the route or routes to the various stations or forts, settlements, etc.

Those made to suit the Braddock and Boquet expeditions to Fort Pitt are rare, only two being comprised in the collection. Those showing the northern routes are numerous. They vary greatly in extent. Many begin with the city of New York, showing its buildings, its harbor with ships, and its many churches, all with steeples. Next Albany is pictured, surrounded with pickets, crowned by a fort on a hill. Its church steeples are generally tipped with crowing roosters. Then comes Schenectady, and after it forts and military stations.

Such maps generally embrace the Hudson and Mohawk rivers, and the country to the New York lakes, sometimes Montreal and Quebec, the two rivers becoming the pathways of both belligerents. These may be called geographical horns. They were not only handsome, but useful to both officers and privates. At that time no printed maps existed which were accessible to the private soldier. As to the source from which such maps were derived, judging from the names of places, some are from French, others from Dutch, some from British, and some from all three sources. There are thirty-two specimens of this character in the collection.

A soldier placed value upon the implements he carried in war, and his musket or rifle and his powder-horn were his constant attendants during years of service. They shared his hardships and dangers, and he learned to love them. At war's close he hung them in a conspicuous place on the wall of his room, where they were constant reminders of his war experiences. With them he never parted, bequeathing them to his descendants or some valued friend. In one case it is related of an old soldier who owned real estate and other property, that in making his will he disposed first of what he prized most—his ornamented powder-horn. Every officer and private carried one, mounted officers, who carried pistols, having smaller horns, such as could be put in the pocket. During the years 1775 to 1760 of the French war, about 10,000 existed in the English and American army, not counting the French. Probably the same number existed during the Revolution.

All the horns carried in the Continental army were marked with initials or names. Many of those made at this period show the spirit that prevailed in the army, as can be seen from the engraved sentiments, such as "Liberty or Death;" in "Defense of Liberty;" "My Liberty I'll have or Death;" "Liberty no Slavery;" "Death before Dishonor."

"In Thos. Gage's war, who came to Boston for ye Americans to enslave and take their rights away."

"Now is the time, ye hearts of oak,
To give our foes a fatal stroke."

"My Soard and Hart shall never Part
It's He that fights for Liberty."

"Within this Horn there doth abide
A Dust to humble Tyrant's Pride.
Then let us rise and play our part,
Stab Bloody Tyrants to the heart."

"The Lord will shield us in the Fight,
And We shall put our Foes to Flight.
Then Freedom shall be ours forever more,
And Liberty resound from Shore to Shore."

Powder-horns were last used in this country in war during the Mexican war in 1848. After that time they rapidly disappeared. As they were too large for hunting purposes many were shortened, and the engraving scraped off.

In addition to the pictures the following actual powder-horns were loaned for exhibition:

Military powder-horn. Length, 18 inches. Inscribed:

Powder With My Brother Ball
Most Hero Like Doth Conquer All,

JONATHAN CLARK LEWIS
His Horn Made By J. G.
Febr the 27 1773.

The opposite side of the horn is carved with representations of a man and a tortoise, bird, deer, bear, wild boar, and camel. Jonathan Clark Lewis was an Indian Trader, an Englishman. He lived and died at Groton, Mass. Died April 7th, 1781. His tombstone has armonial bearings cut thereon.*

Lent by Mr Rufus A. Grider, Canajoharie, N. Y.

Military powder-horn. Length, 19½ inches. Inscribed:

JABEZ GOODDEL'S HORN.
Made June ye 7th A. D. 1776.

To Arms, O Free-born Sons,
Exert the Sword and Spear,

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* *N. E. His. and Gen. Reg.*, Jan., 1896.

Oppose the Tyrant, and —— hands
Defend your Rights most Dear.

Etching of file of troops.	**Street Firing.** **Make ready.** **Present.** **Fire.**	**Etching of opposing file of troops.**

With an intent to give the fatal Blow,
The cause he fights for animates him high.
Namely, religion and dear Liberty.
For these he conquers or more bravely dies,
And yields himself a living sacrifice.

Lent by Mr. J. Colvin Randall, who purchased it in a curiosity shop in Birmingham, England.

Military powder-horn. Length 14 inches, with brass powder measure attached by thong.

Inscribed in ink: "James Ross, January 24, 1777, Capt. Brisbans Company, 22d Penn Battalion." Lent by Mr. Richard H. Day, who suggests that the idea of the metallic cartridge may have been derived from the powder measure.

Military powder-horn. Length 14 inches. A geographical horn, inscribed with a map of the Hudson and Mohawk valleys, with British coat-of-arms, picture of New York, etc., and with blank scroll for name.

Lent by Mr. Charles E. Osborn.

Military powder-horn. Length 16 inches. A geographical horn, inscribed like the preceding, but in greater detail. Made (according to Mr. Grider) to commemorate the capture of Fort Niagara, July 24th, 1759. Bears the name of John Derbyshire, the great-great-grandfather of Mrs. Felix E. Schelling, by whom it was loaned for exhibition.

Powder-horn (hunter's). Length 11½ inches. Engraved near small end with royal arms of England; below the legend "Philadelphia," and a plan of the city. The latter consists of 40 small rectangles (8 by 5), representing as many city squares. The names of Water, Frond, and Second Streets appear, and Market, Arch, Race and Wyne (*sic*). The old British barracks (on Second Street between Noble and Buttonwood) are represented north of the city, and the "Associated Battery" below. Windmill Island is shown, with vessels in the river.

On one side an Indian hunter with dogs is depicted shooting at a wild boar and a deer. The date has been fixed approximately about the middle of the last century.

Lent by the Historical Society of Pennsylvania, to whom it was presented by M. M. Barker in 1869.

Powder horn (hunter's). Length 13½ inches. Inscribed with picture of an Indian hunter carrying a gun and wild turkey; above wild geese. On the opposite side a hunter in European dress skinning a deer, his rifle standing against a tree, and his dog beside him. Dated 1799. The designs on this horn are highly artistic and the horn itself of remarkably beautiful colors. It was purchased during the present year from B. M. Youells, of Scranton, Penna., who procured it in 1849 from Mattew Henry, of Bushkill, who is said to have inherited it from his father, William Henry. He is said to have acquired it from the Rev. J. Heckewelder, the missionary.

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Department of Archaeology and Paleontology,

UNIVERSITY OF PENNSYLVANIA.

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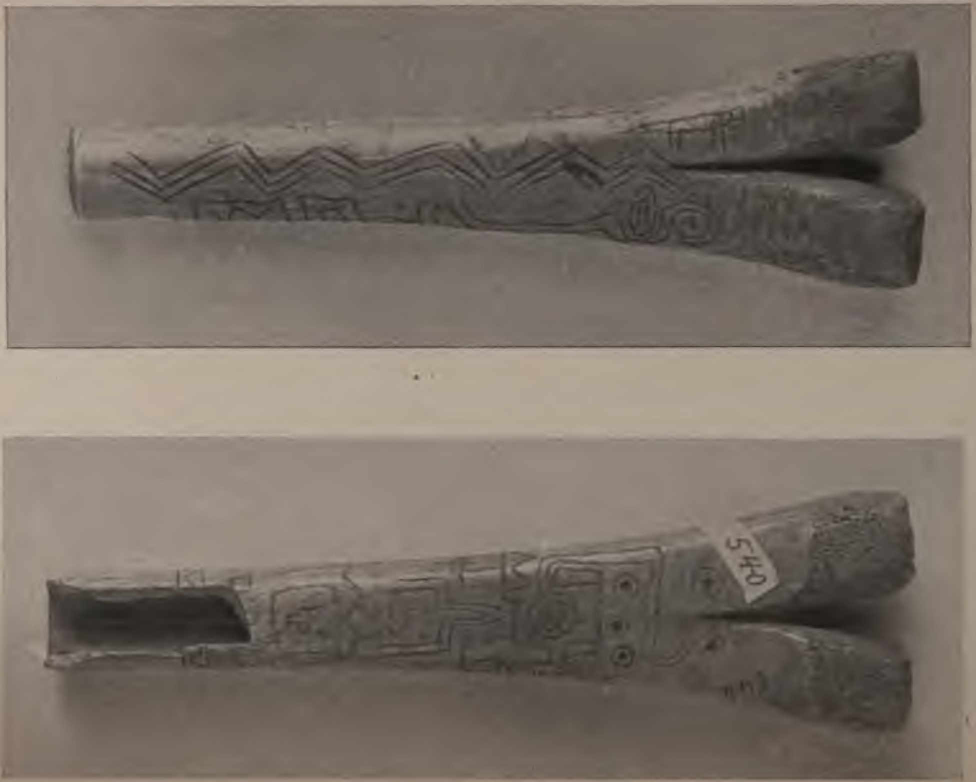

Plate 13.—Ancient snuffing-tube from Tiahuanaco, Bolivia. Natural size. Museum of Science and Art, 36,095
(*See page 159.*)

BULLETIN

OF THE

Free Museum of Science and Art

OF THE

UNIVERSITY OF PENNSYLVANIA.

No. 4. PHILADELPHIA, JUNE, 1898. VOL. I.

A SNUFFING-TUBE FROM TIAHUANACO

BY DR. MAX UHLE

The implement shown on Plate 13 is a snuffing-tube for inhaling a powder by holding its upper end to the nostrils and placing the lower end in the powder. This use is proved by a number of analogous implements collected from the Indian tribes of Brazil and Venezuela.

It was obtained by the writer at Tiahuanaco in June, 1895, with other antiquities found on the surface of the ancient ruins, or discovered in plowing, or in small excavations, and sold to him by people of the village. He was assured that it was found in the same way. Its character shows that it was made at Tiahuanaco in ancient time.

The tube consists of the wrist or leg bone (metacarpus or metatharsis) of a young llama-like animal, as was confirmed by comparison at the Academy of Natural Sciences of Philadelphia.

The bone has been cut off at each end, and while at the upper end a part of the shaft has disappeared, at the lower end, bifurcating naturally, only the distal articulations have been cut away and each part bored, so as to communicate with the main tube. The caliber of the former is $\frac{1}{4}$, and that of the latter $\frac{18}{32}$ of an inch.

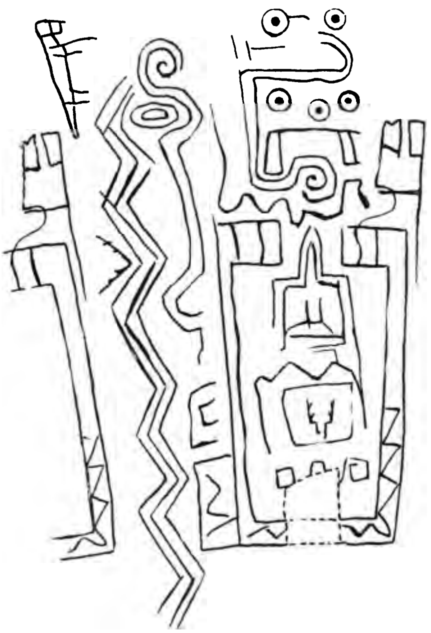

Fig. 19.—Design on snuffing-tube, from Tiahuanaco.

The bone is much scraped on all sides and engraved after two technical types—deep circular engravings and superficial linear scratchings (Fig. 19). The circular engravings confirm the antiquity of the object, as this kind of ornament was common on prehispanic implements of bone. The scratchings, unartistic and inexact, might be attributed to a recent time. The designs, however, indicate a prehistoric origin. On the front of the implement is a small standing human figure covered with a poncho. The nose only is marked on the face. Over the brow is a feather-like head-dress. The breast is covered by a shield-like ornament. Where the short legs were expressed, a small piece is broken, leaving them incomplete. A square frame partly decorated by zigzag lines surrounds the figure and is surmounted on one of its upper edges by an ornament which, by the opening of the mouth and a slight indication of nose and chin, rudely expresses an animal head. This ornament corresponds in character to bands ending in animal heads frequently found attached to relievo figures on the stone works of ancient Tiahuanaco.[1] As the present Indian inhabitants of Tiahuanaco do not use or understand the ornamentation found on the ruins, the implement must be regarded as prehistoric and made at a time near to that great first epoch of Tiahuanaco.

There are some figures of less significance on the bone:

---

[1] See Stübel und Uhle, *Die Ruinenstätte von Tiahuanaco*, 1892, pl. 8–21.

a snake-like drawing[1] of zigzag lines, represented with a nose and eye, and a small four-footed animal, possibly a quadruped or an insect. Each of these figures is directed towards one of the two branches of the tube, which formed the upper end of the implement when used. They may, therefore, represent a supposed vitality of the inhaled powder. There are also some lines on the front of the tube above the human figure, surrounding the circular engravings. Their meaning is clear only in part. It seems they were also intended to represent an animal (perhaps with two of the circular engravings as eyes), as may be concluded from the foot-like appendices.

The chronicler Garcilaso remarks that the ancient Peruvians used tobacco (*sairi*) for snuffing.[2] He gives us the first clue to understanding the tube in question. Later Alexander von Humboldt[3] stated that the Otomacos believed they could not take their snuff without tubes, and all that has transpired since proves that the same is true of all Indians east of the Andes who are addicted to snuffing. It is surprising, with this in mind, that the Peruvians, a people who also practiced snuffing, have not been suspected heretofore of using tubes.[4]

Snuffing tobacco, for a long time confirmed only by the work of Garcilaso, was neither of mean importance nor small geographical extension in Peru. We are fortunate in now possessing increased material for the study of the ancient customs of that country in the old provincial reports, published since 1881 by Mr. Jiménez de la Espada at Madrid. We learn from them that the practice of snuffing must have been nearly general in the Highlands of middle and southern Peru, for it is reported from Jauja (middle)[1], from Lucana (southern Peru)[2], and from La Paz (Bolivia)[3]; and we have also to add Abancay[4], Alca[5], and Chumbivilca[6], in Southern Peru, where tobacco, according to the reports, was used as a medicine. The mention of its use for snuffing for these latter places seems to have been omitted only for the sake of brevity, as in all other respects there is no difference in the notices.

---

[1] While at Tiahuanaco the writer stated the existence of snake-figures not observed before (see Stübel und Uhle, l. c., p. 23 Anm 2) worked in stone, and as ornaments on pottery of the same period.

[2] Garcilaso, *Comm. Reales*, Pt. I, b. 2, ch. 25.

[3] Alex. v. Humboldt, *Pers. Narratives of travels to the Equinoct. Regions of America.* Transl. by Thomasina Ross, II p. 504.

[4] Snuffing tobacco was also practiced in ancient Mexico, and it might be supposed that there likewise it was not done after the European manner. Mr. Ling Roth, in *Journ. of Anthrop. Inst. of Great Britain*, 1887, p. 260, mentioned a snuffing-tube of Mexican origin in the British Museum, but I am informed, by kindness of Mr. Charles H. Read, that this was an error, he mistaking a snuffing-tube from the Madeira River, in the British Museum for Mexican.

We should probably have similar statements of the use of snuffing tobacco from the Highlands of northern Peru, if provincial reports from that region were published.

The custom of snuffing tobacco, as depending on ancient practices, is found elsewhere in South America only in the immediate neighborhood of the civilized districts of ancient Peru, as among all tribes of the Purus River according to the observations of Dr. Ehrenreich[7] and among a plurality of tribes of the Ucayali River according to Marcoy[8]. In detail we know that snuffing is common among the Yamamadis, Ipurinas, Antis, Chontaquiros and Conibos.[9]

As the districts of these tribes border the ancient area of snuffing in civilized Peru and the object of the practice is partly (among the Ucayali tribes) identical,[1] the derivation of the custom of these tribes from Peru is only a natural conclusion.[2] The dissemination of the custom east of the Andes may be compared with that of chewing coca, which has been extended along the banks of the Amazon River down to the mouth of the Japura,[3] and according to Chandless also exists on the Upper Purus.[4]

---

[1] *Relac. Geogr.*, I p. 86: é que no sabian antiguamente curarse, más de que despues quel Inca los señoreó, hubo algunos que sabian sangrar con puntas de pedernal, y se purgaban con unos frisolillos que llaman vilca, y tomaban el polvo de tabaco por las narices.

[2] l. c., I p. 192: y ansí mesmo usan para esternudar el tabaco molido, con lo cual dicen que sienten provecho; l. c. I p. 211: y ansi mesmo usan del zaire, que por otro nombre se dice tabaco, y lo toman en polvo en poca cantidad por las narices.

[3] l. c., II p. 76: Hay tambien entre los indios tabaco, que ellos le llaman sayre, de que los negros usan mucho, y los indios de la raíz que llaman coro, y se purgan con ello y lo toman en polvos.

[4] *Relac. Geogr.* II p. 209 and 218.

[5] l. c., II p. 19.

[6] l. c., II p. 15.

[7] *Beiträge zur Völkerkunde Brasiliens*, 1891, p. 55 and 62.

[8] Marcoy, *Voy. à travers l'Amér. du Sud*, 1869, p. 574.

[9] Orton, *The Andes and the Amazon*, 1870, p. 197, mentions a different custom of snuffing tobacco in use among the Indians of the Napo: "This last they roll up in plantain leaves and smoke, or snuff an infusion of it through the nose from the upper bill of a toucan." The brevity of the notice prevents us determining the relation of this custom to the others of snuffing tobacco.

The use of snuffing was found more in a certain area of South America in connection with the powder *paricá* or *niopo*, obtained from the seeds of species of Piptadenia, from the sub-genus Niopo, especially from *Piptadenia peregrina.*[5] The principal tribes which had this custom were on the Amazon: The Omaguas,[6]

---

[1] Tobacco was taken as snuff for easing the head, which custom is parallel to that indicated by Garcilaso for ancient Peru, and also as preservative against coryza (colds) after baths.

[2] The name used for tobacco among the Yamamadis and Ipurinas of the Purus River do not show particular reference to the word *sairi* of the Kechua language. The word *sina* of the Yamamadis (Ehrenreich, *Zeitschr. f. Ethnol.*, 1897, XXIX p. 65) reminds one more of Guana: *tena*, tobacco (Boggiani, *Vocabulario del Idioma Guana* in: *Reale Accademia dei Lincei*, 1895, p. 22) and, on the other hand, the word *hädyiri* of the Ipurinas (Ehrenreich l. c., p. 69) of the common Arawak words *yaari, yoari*, etc., for tobacco (cf. v. Martius, *Beitr. zur Ethnogr. Brasiliens*, 1867: I, *zur Ethnogr. Amerikas*, p. 719, II, *Wörtersamml. brasil. Sprachen*, p. 425). The knowledge of the tobacco plant itself could have reached these Indian tribes from other parts than the civilized countries. From Kechua *sairi* other tribes may have derived their word for tobacco (to comp. Mura *tschehae*, v. Martius, *Beitr.*, II p. 424. The Muras have been said to have emigrated from Peru, l. c., I p. 411; Guana *tschai* and *tschahe* according to Cardús, *Las Misiones franciscanas de Bolivia*, 1886, p. 324, and v. Martius, II l. c.)

[3] v. Spix und v Martius, *Reise in Brasilien*, 1831, vol. III, gives much information in regard to the use of coca on the Upper Amazon. Von Martius, moreover, found a plantation of coca near Ega, a village at the mouth of the Japura River. *Reise*, III p. 1169.

[4] To compare Ehrenreich, *Beitr.*, p. 62.

[5] Von Martius, *Flora Brasiliensis*, 1870–76, vol. XV, Leguminosæ, pt. III Mimoseæ, p. 283. Synonyms are *Acacia niopo*, *Mimosa acacioïdes* (and *Inga sp.*). *Piptadenia peregrina* is the present name of the plant, from which, according to v. Martius, nearly all the powder of *niopo* is obtained in Brazil and Venezuela.

[6] De la Condamine, *Relation abrégée d'un voyage fait dans l'Int. del l'Amér, mérid.*, 1745, p. 75; v. Spix und v. Martius, *Reise*, III p. 1193 (v. Martius, *Beitr.*, I p. 441).

Tecunas,[1] Passes,[2] Muras,[3] and Mauhes[4]; on northern tributaries, the Japura: the Witotos,[5] the Rio Branco: the Paravilhanas[6]; in the Orinoco system: especially the Otomacos, Guahibos, Salivas, Yaruros[7] and perhaps the Maipures and Tamanacos.[8] The practice of snuffing was also extended to Haïti,[9] and has been occasionally ascribed to the Tupis of Eastern Brazil,[10] and was also observed near Córdoba in the La Plata countries, as I hope to be able to show. The customs of these three regions still need a special examination.

The distinguished ethnologist Dr. Ernst called attention to the word *pety cui, pó de tabaco para ser aspirado,* found in the old dictionary of the Tupi language, which was published by Almeida Nogueira in 1879, and I also find *pytýma çuí,* "*tabaco de pó*" in the old dictionary of the Jesuits, published by v. Martius.[11] But so far as I know there exists no other report of the practice of snuffing tobacco among the Tupis. On the other side Martius mentions that the manufacture of costly tobacco snuff (*pytyma çuî*) under the direction of the colonists is an important industry of the aldeized Indians of

---

[1] v. Spix und v. Martius l. c., p. 1318, also 1193 and *Beitr.* l. c.

[2] v. Spix und v. Martius l. c., p. 1186.

[3] v. Spix und v. Martius, l. c., p. 1074 (also *Beitr.*, I p. 411); H. W. Bates, *The Naturalist on the River Amazon*, 1864, p. 194.

[4] v. Spix und v. Martius, l. c., p. 1075, 1193, 1318 (also *Beitr.*, I p. 390, 411); H. W. Bates, l. c.

[5] According to Crévaux. I have before me only a clipping from the *Mechanical News*, which periodical may have drawn its notice from Crévaux's report indirectly. The original work of Crévaux, as well as the *Tour du Monde* and the corresponding parts of *Globus* are inaccessible to me.

[6] v. Martius, *Beitr.*, I p. 631, after *Revista trimensal*, 1850, VI 203.

[7] For all these tribes see Gumilla, *El Orinoco ilustrado*, 1745, I 203; P. Gili, *Saggio di storia americ.*, 1780, I 201; Alex. v. Humboldt, l. c., p. 504–506; M. E. de Rivero, *Col. de memor. cientif.*, 1857, I p. 103.

[8] According to Gili, the Maipures call the powder *nupa* and the Tamanacos *aoulpa* (? in the copy of Gili's work, which I consulted, the print is here defective).

[9] *Life and Actions of Christophe Columbus*, including a report of Padre F. Roman, in Churchill, *Coll. of travels*, Vol. II p. 566, 570, 572, 574; Petr. Martyr, *Decad. americ.*, Dec. I, b. 9, ed. 1574, p. 109.

[10] A. Ernst, *American Anthropologist*, 1889, II p. 135.

[11] v. Martius, *Beitr.*, II p. 86.

Borba, Serpa, and other towns of the lower Amazon.[1] Therefore it must be admitted that perhaps the word *pytyma çui* in the dictionaries is only derived from that industry, and it would be wise for us to delay the admission of the originality of the custom.—

There are from Haïti various accounts of the practice of snuffing a powder called *cohobba* (*or cogioba*) which intoxicated, caused visions, and was used especially in religious ceremonies. There is another account by Oviedo y Valdés,[2] that the Haïtians used to inhale the smoke of tobacco leaves laid over the fire by means of forked or single tubes. Numerous authors have confounded the above accounts. For instance, Mr. Ling Roth, in a meritorious article on the ancient Haïtians, referred all those reports to the inhaling of smoke of tobacco.[3] Von Martius likewise identified tobacco with *cohobba*,[4] and Dr. Ernst, considering *cohobba* as tobacco snuff, supposed Oviedo to have erroneously confounded snuffing tobacco powder by tubes with smoking tobacco leaves in cigars.[5]

Jefferys[6] mentions the peculiar custom of the Haïtians to lay the moistened leaves of tobacco over half-glowing coals, and in this manner to inhale the smoke.[7] This notice may be considered as an argument in favor of the correctness of Oviedo's report.[1]

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[1] v. Martius, *Beitr.*, I p. 721.

[2] *Hist. gen. y nat. de las Indias*, pt. I, b. 5, ch. 2.

[3] *Journ. of Anthrop. Inst.*, 1887, p. 258.

[4] *Beitr.*, I p. 720.

[5] *Am. Anthropol.*, l. c., p. 134.

[6] *Nat. and Civil History*, London, 1760, quoted by Ling Roth, l. c.

[7] That Ernst in vain attempted to inhale the smoke by a snuffing-tube is no argument against the correctness of Oviedo's report, as he used a snuffing-tube of the Guahibos for that purpose, and it is possible that the wooden tubes used in Haïti, and illustrated by Oviedo, were of a larger caliber. The smell of tobacco and the powder of *niopo* is similar, as referred to by Gumilla, and the effect of the one compared with the other is so similar as to lead Gili to describe the *niopo* plant as a kind of tobacco tree. For the same reason the two powders are sometimes interchanged. According to Rich. Schomburgk's *Reise in Guiana*, III p. 103, the powder of *paricá* or *paricarama* (?) is ignited and the smoke inhaled. Similarly the Haïtians could apply snuffing-tubes for inhaling the smoke of tobacco. For *paricarama*, as referred to in Schomburgk's notice, might be compared the mention of *parica rana*, an acacia, as a medicinal plant in v. Spix und v. Martius, III p. 1187. *Rana* in Tupi signifies spurious, v. Martius, *Beitr.*, II p. 86.

Furthermore, in contradiction to what Mr. Ling Roth supposed, it is clear by the reports that the *cohobba* used for snuffing was a substantial powder.

The establishment of the latter fact does not determine the connection between the powder *cohobba* and tobacco. But the following facts will prove clearly that they were entirely distinct from each other.

1. The universal separation of *cohobba* from tobacco in

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[1] There is, perhaps, another circumstance more which supports Oviedo's description of inhaling the smoke of tobacco by tubes. Dr. Ernst himself points out that the Haïtian name of the snuffing-tubes may have been *taboca*, which circumstance tends to confirm Oviedo's derivation of the word tobacco, from the name of the snuffing-tubes. The discovery that the Haïtian snuffing-tubes were called *taboca* was made by Ernst nine years ago, anticipating the same discovery by the writer. It is true that Ernst based his discovery upon the idea that *taboca* signifies the snuffing-tube among the Muras, which is not the case (v. Spix und v. Martius, *Reise*, III p. 1075, v. Martius, *Beitr.*, I p. 411). But I am able to produce now stronger evidence. *Taboca* in Tupi originally was the term for a kind of reed (compare v. Martius, *Beitr.*, II p. 87. A hill *das tabocas* exists near the town of Caxias in eastern Brazil in the ancient Tupi region. Yves d' Evreux, *Voy. dans le Nord du Brés.*, Notes par F. Denis, 1864, p. 404). This word exhibited a peculiar aptitude for spreading throughout the various languages of northern South America (similar to the Tupi: *tacuara* reed). It always signified implements actually or originally made of reed; for instance, boxes made of reed used for preserving the *niopo* powder, Mura (see v. Spix und v. Martius, and v. Martius as above), boxes for preserving coca (at Ega), v. Spix und v. Martius, III p. 1169, round nose plugs, ¼ inch thick, 1½ inch long, of the Miranhas (v. Martius, *Beitr.*, I p. 536; Padre Armentia similarly says of the Pacaguaras in eastern Bolivia: they carry a *tacuarita* in their nose, Cardús, l. c., p. 291). The Juri Tabocas, a horde of the Juris, received their name from a lip plug of palm wood (v. Spix und v. Martius, III p. 1236 and 1280). The Passes also call the lip plugs *taboca* (l. c., p. 1204). In this way the name *taboca* may also have been given to the snuffing-tubes in Haïti, which is not surprising, as Dr. Brinton, in *The Arawack Language of Guiana*, 1871, p. 18, gives two other very significant proofs of Tupi words in the Taino language (Haïti). I believe there is no doubt that the modern name of tobacco is derived from the word *taboca* of Tupi origin, which, in Haïti, signified tubes; and it is to be regretted that Ernst gave up this derivation, impressed by the supposed error of Oviedo, so as to embrace as the correct one a very problematic and improbable derivation from Arawak *tuka*, to smoke; *dattukapu*, I shall smoke, changed by a supposed neglect in *dattupaku*.

the reports is contrary to any supposition of their synonymy.

2. The word *cohobba,* as Petrus Martyr, or *cogioba,* as F. Roman spells it, is not derived, as Ernst[1] and von Martius suggested, from the Tupi language, but is probably the same word as *curuba* and *yupa,* the Otomaco word for the Piptadenia powder according to the two authorities Gili and Gumilla,[2] and

3. The extreme strength of the powder as described by Petrus Martyr,[3] exceeding that of tobacco, decides its different nature and its Piptadenia character.

It would seem strange if the Haïtians should have learned from the continent the use of snuffing-tubes and not the powder used in connection with these tubes.—

The *Relaciones geográficas,* II p. 152, give the following account of a custom of the Indians who lived near Córdoba, in the Argentine:

> "Toman por las narices el sebil, ques una fruta como vilca[4]; hácenla polvos y bébenla por las narices."

The curious expression, they drink the powder with the nostrils, means without doubt that the Indians took the powder by means of an instrument like a tube. Concerning the word *sebil,* Napp[5] tells us that *sebil* is in the Argentine the name of the Acacias. Now, the fact that Humboldt originally pointed out the *niopo* tree as a species of Acacia by mistake and von Martius called it *Mimosa acacioïdes* proves that Piptadenias and Acacias have sometimes been confounded. We know, further, that Piptadenia trees of the variety *niopo* are also common in eastern Bolivia and the Argentine (for instance *Piptadenia*

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[1] *Am. Anthropol.,* l. c., p. 136.

[2] Father Gili: *curúba,* Gumilla: *yupa.* If two persons so differently conceived the same name for the same plant among the same tribe, it is not surprising that the Haïtian word *cogioba* is slightly different from the original word *curupa.*

[3] Petrus Martyr, l. c.: Tanta est pulveris illius contusi vis ut sensum omnem ilico sumenti eum, tollat. Ut primum cessit insania, etc.

[4] Probably also a Leguminosa, according to Middendorf, *Wörterb. des Runa Simi,* 1890, p. 459. A beverage made of it, served as purgative, but also as narcotic for foretelling in Peru and Bolivia, v. Tschudi, *Beitr. z. Kenntn. d. Alten Peru,* 1891, p. 171.

[5] *The Argentine Republic,* 1876, p. 114.

macrocarpus, in the province of Tucuman [1]), and as the bark of the *curupau* tree, which from its name and general description may be a *niopo* tree, serves, according to Cardús,[2] to tan hides in eastern Bolivia, so in like manner the bark of *sebil* is used to tan hides, as I noted, in the environs of Tucuman. All this leads to the conclusion that the tree, from whose seeds the powder was made, is related to *niopo*, and a scientific determination may perhaps show it identical with *niopo*.[3] The custom of snuffing *sebil* in the environs of Córdoba was, therefore, derived from another part of the continent, where snuffing *niopo* was practiced.

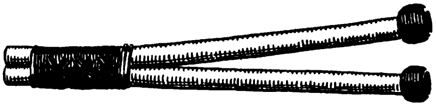

Fig. 20.—Snuffing-tube, one-third, Ipurina Indians, Purus River. Berlin Museum.

In examining the methods of snuffing in South America, we observe some peculiar features which do not belong to all other customs of the South American Indians.

The snuffing-tubes used are of various shapes, but all rest upon two principal types, one of which may be pointed out as the primitive, the other as the basis of all more developed shapes.

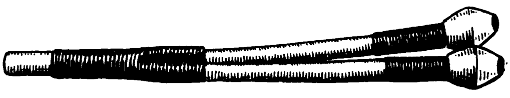

Fig. 21.—Snuffing-tube, one-third, Otomaco Indians, Orinoco River. Berlin Museum.

1. The primitive type is the single tube, which has been found among the Yamamadis,[4] Mauhes,[5] and in Haïti,[6] and probably occurred among many other tribes. This shape, as a general rule, reappeared when tubes of the more developed shapes were

---

[1] v. Martius, *Flora Brasil*, l. c., p. 282.

[2] Cardús, l. c., p. 339.

[3] After writing the above explanation I was informed by Dr. Niederlein that the *sebil* trees of the Argentine, before classified erroneously as Acacias, are acknowledged now as being Piptadenias (*niopo*, etc.). I could scarcely have expected such prompt confirmation of what I supposed above.

[4] Ehrenreich, *Beitr.*, p. 55.

[5] v. Spix und v. Martius, III p. 1318.

[6] Oviedo y Valdés, l. c.

missing. But being primitive, it possesses no comparative value.

2. The other principal type is the forked tube. It deserves attention in that it has been found in a wide geographical extension with its shape nearly unchanged. Its existence has been confirmed in the Highlands of Bolivia (Plate 13), among the Ipurinas (Fig. 20),[1] among the Omaguas,[2] Tecunas[3] (Fig. 22), and Mauhes,[4] among the Otomacos[5] (Fig. 21), Guahibos[6] and Yaruros,[7] and also in Haïti.[8]

The double-tubed instruments of this type found among the Tecunas, Mauhes and Ipurinas, represent only a variety in which the bifurcation of the upper has been continued to its lower end.

It is worthy of attention that the forked tubes of Tiahuanaco, the Orinoco River and Haïti, found at the periphery of the whole area of snuffing, and at great distances from each other, fully agree in form in contradiction to the slightly transformed forked tubes of the centre.

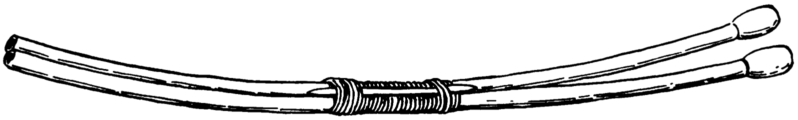

Fig. 22.—Snuffing-tube, Tecuna Indians, Amazon River. Munich Museum.

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[1] Ehrenreich, l. c., p. 62. I am indebted for the drawings of Fig. 20, 21, 23, 24 to the kindness of Mr. W. v. d. Steinen, of Berlin.

[2] De la Condamine, l. c.

[3] v. Spix und v. Martius, III p. 1318, and *Atlas zur Reise*, Tafel: *Indianische Geräthsch.*, Fig. 47. The instrument is preserved in the Munich Museum, and one of the figures in Ratzel, *Völkerkunde*, 1886, II p. 610, is a reproduction of it.

[4] v. Spix und v. Martius, III p. 1318; *Beitr.*, I p. 411.

[5] To compare Gili, l. c., and Alex. v. Humboldt, l. c. The snuffing-tube of the Otomacos, in the Berlin Museum, is perhaps brought back by Humboldt.

[6] A snuffing-tube in the British Museum from the Guahibos is given by Ratzel, l. c., p. 611 Fig. 1. Another snuffing-tube from this tribe, preserved in the National Museum of Carácas, has been described and reproduced by Ernst in *Verhandl. der Berl. Gesellsch. f. Anthrop.*, 1886, XVIII p. 521.

[7] M. E. de Rivero, *Col. de memor. cientif.*, 1857, I p. 103 and 104.

[8] *Life of Columbus*, etc., in Churchill, *Coll. of Voy.*, Petrus Martyr, Oviedo y Valdés, l. c.

3. The tubes of this central sphere show still other transformations of the original forked type. Angular snuffing-tubes, as shown in Figs. 23 and 24, are common along the Ucayali River[1] and in Chanchamayo, and occasionally found on the Amazon[2] (Fig. 25). This type can only be explained as derived from the forked tube as its prototype, because in no other way the angular combination of two tubes could be accounted for.

4. The Witotos have an instrument, which consists of two bones crossed in the shape of an X, and by means of this two individuals blow the powder into each other's nostrils, as shown in Fig. 26. This curious type is also derived from the forked tube. In a certain sense it represents a departure in the opposite direction from that which led to the angularly combined tubes. In the former case, the two arms of the original implement were separated, so as to admit a reciprocal use of the snuffing powder.

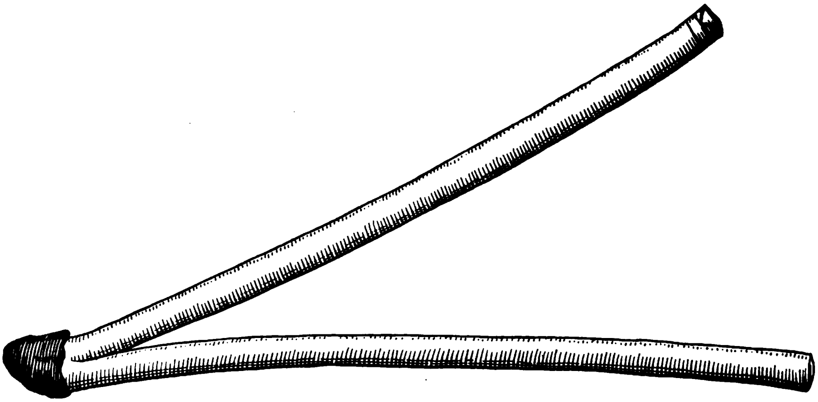

Fig. 23.—Snuffing-tube, one-third, Chanchamayo, Peru. Berlin Museum.

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[1] To compare snuffing-tubes of the Conibos in the Berlin and British Museums, the latter one reproduced by Ratzel, l. c., p. 611 Fig. 2, and a snuffing-tube from Chanchamayo with arms of unequal length in the Berlin Museum; furthermore, the notes on the snuffing-tubes of the Antis in Marcoy, l. c.

[2] The snuffing-tube of the Muras, in the Munich Museum, was reproduced by v. Spix und v. Martius, Atlas, Taf.: *Indian. Geräthsch.*, Fig. 63, and Ratzel, l. c., p. 610. Another snuffing-tube, consisting of two tubes joined in an acute angle, is reproduced by v. Spix und v. Martius, l. c., Fig. 49, but does not seem to have been preserved.

In the latter they were separated and differently joined, admitting only an individual use of the tube for one nostril or at the most by engaging another individual for blowing.

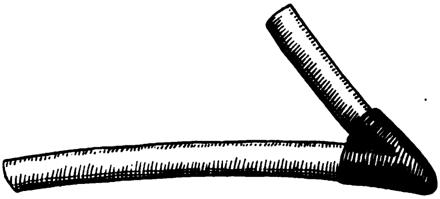

Fig. 24.—Snuffing-tube, one-third, Conibo Indians, Ucayali River. Berlin Museum.

5. There remain very short tubes, joined at an angle and open at both ends, used by the Antis for inhaling the snuff with both nostrils.[1] This shape might appear to have been the older type than the forked tube; nevertheless I am inclined to believe it a modification from that latter, which dominates in the area of snuffing, as explained above, and corresponds more closely as the archetype of all the others.

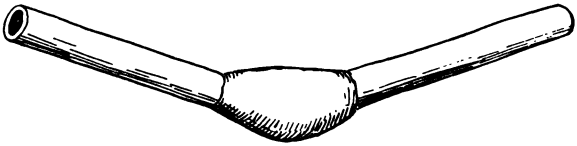

Fig. 25.—Snuffing-tube, Mura Indians, Amazon River. Munich Museum.

The extent of the changes in the shapes of the snuffing-tubes, as we have seen, was not great. The oldest type dominates at peripheral points of the area of snuffing widely remote from each other. Changes of the original type, apparently similar to shrinkage, took place in the centre. It is to be regretted that at present we have no knowledge of the snuffing-tubes of the environs of Córdoba.

Only two kinds of powder were used, tobacco and that of the seeds of *Piptadenia niopo*, and these within distinct zones. Furthermore, excepting the word *sebil*, only two primitive words, *curupa* and *paricá*, designated the latter powder in South America. Of these the word *curupa* belonged to a western, the word *paricá* to an eastern subzone. The latter word originated from the Tupi language,[2] and has spread throughout northeastern South America[1] and a large part of the Amazon region, its fixed use reaching westward at least to the mouth of the Javary River.[2] On the other hand, the Omaguas on the Amazon, the tribes of the Orinoco River, and the ancient people of Haïti, all of different nationality, used the word *curupa* or derivations from it.[3] The slight modification the word has undergone in this area would indicate its dissemination among the tribes to have been the work of only a few hundred years.[4]

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[1] Marcoy, l. c.

[2] v. Martius, *Beitr.*, II p. 403. In the province Para the geographical name: Paricatuba, l. c., p. 519. Because of the Tupi origin of the word the Brazilians

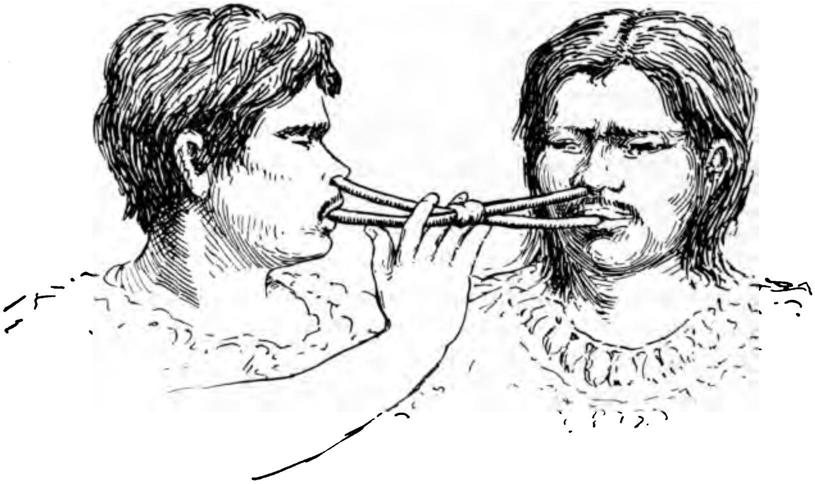

Fig. 26.—Manner of snuffing, Witoto Indians, Napo River. After Crévaux.

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prefer the name *paricá* when speaking of the powder. Yves d'Evreux, l. c., p. 416.

[1] In British Guiana according to Rich. Schomburgk, l. c.

[2] According to v. Martius, *Flora Bras.*, l. c., p. 283. A name of a river Curupatuba exists on the lower Amazon east of Santarem, and is translated by v. Spix und v. Martius, l. c., III p. 1325, as "*niopo* place". If this explanation is correct (there are more words in Tupi sounding like *curuba*, compare v. Martius, *Beitr.*, II p. 393, v. Spix und Martius, III p. 1282), the name might seem to be a result of interchanges natural on such a river.

[3] *Curupa* Omaguas, *curûba* and *Yupa* Otomacos, *nupa* Maypures, *yopo* Yaruros, *niopo* Orinoco tribes, *cogioba* and *cohobba* Haïti. Alex. v. Humboldt already called the attention to the curious fact that the tribes of the Orinoco River and the Omaguas of the Amazon showed some relation to each other by the word *curupa*.

[4] The comparatively late origin of the custom of snuffing *niopo* becomes still clearer on considering in general the use of tobacco in South America. The latter occupies nearly the whole continent. The names for the tobacco

The character of the changes in the shapes of the snuffing-tubes, as pointed out above, would not lead to any other conclusions.—

The peculiar manner visible in the distribution of the use of snuffing would also be a good argument in the same direction. The practice is missing, as far as we know, in southeastern South America in the direction of Rio de Janeiro, but is very general in the Amazon Valley. Setting aside for a few moments the practice of snuffing of the environs of Córdoba, we have to come to the conclusion that east of the Andes it spread out through the Amazon system, and from there, without much difficulty, passed over to the Orinoco River and to more remote Haïti.

The geographical reasons for its distribution outweigh the national ones. While the Omaguas, Muras and Mauhes of the Tupi stock[1] practice snuffing, the Mundurucus,[2] who are also Tupis, and apparently the Tupi tribes[3] of the southeast, do not use snuff. But in the Amazon Valley and north of it the practice of snuffing is common among Indians of different stocks, as Arawak, Tupi, Pano, Carib and others.[4] All of

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are much more differentiated than those of *niopo*. Some words, as, for instance, the Arawak word *yaari*, belong to great tribal stocks, having wandered with them. I might compare the general custom of snuffing *niopo* with the single fact of the late introduction of the Tupi word *pytyma* for tobacco in Chile, and also that of the distribution of the use of tobacco pipes in the southern parts of the continent by Guarani influences. Ancient tobacco pipes are found, for instance, in Rio Grande do Sul, the province of Buenos Ayres (Ameghino, *Antiguedad del hombre en el Plata*, 1880, I Pl. 7), where Tupis were living, and in Chile, and at the present time tobacco pipes are still in use among the Guarayas, Chiriguanos and Siriones of the Tupi stock in eastern Bolivia (Cardús, l. c., p. 79, 249, 282). Furthermore, the ancient Calchaquis may also have used pipes. I saw a pipe of soft stone, believed to be ancient, at Belen in the province of Catamarca.

[1] Brinton, *The American Race*, 1891, p. 236.

[2] v. Martius, *Beitr.*, I p. 390.

[3] For the same reason the idea of Ernst, who says the use of snuffing tobacco was characteristic of the Tupi tribes and derived from them (*Amer. Anthropol.*, l. c., p. 135) is not acceptable.

[4] According to Brinton, l. c., p. 249, 258, 266, 269, 271, 287, 292, and Ehrenreich, *Zeitschr. f. Ethnol.*, 1897, p. 59, the tribes practising snuffing were distributed among the stocks as follows, Passes, (Maipures,) Tainos, Yamamadis, Ipurinas, Antis and Chontaquiros: *Arawak;* Paravilhanas (and Taman-

which confirms our conclusion that the dissemination of the use of snuffing *niopo* was one of the last phenomena in the development of the customs of the eastern South American tribes.

The question arises, Are there any indications as to the source of this practice?

I have attempted above to point out that the use of snuffing tobacco of the Ucayali and Purus Indians originated in the Highlands of ancient Peru. The areas of snuffing tobacco and snuffing *niopo* are contiguous. The intimate relation between the use of both powders is apparent by the analogy of the implements connected with them.[1] It is, therefore, very natural to suppose that the one arose from the other. The practice of snuffing tobacco, according to my explanations, must have been of older date than that of *niopo*. As a consequence the use of the latter powder will have originated in the tobacco-snuffing area. Furthermore, the snuff of tobacco is milder than that of *niopo*,[2] and the use of tobacco snuff medicinally in ancient Peru is well confirmed,[3]

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acos): *Carib;* Conibos: *Pano;* Omaguas, Muras, Mauhes: *Tupi;* Otomacos, Guahibos, Yaruros, Salivas: *isolated* stocks.

[1] The secondary implements used for snuffing are also analogous. The snuff-box for tobacco powder of the Purus tribes (Ehrenreich, *Beitr.*, p. 62) and of the Antis is made of a *Helix*, and, at least among the former, provided with a cylindrical neck. The boxes used by the Witotos for preserving the *niopo* powder are alike; the same is the case with that represented in v. Spix und v. Martius, Atlas, l. c., Fig. 48, and probably also with those used by the Yaruros, according to M. E. de Rivero, l. c.

[2] Gili, Gumilla, Petrus Martyr, l. c. The powder of *niopo* is so strong that in northern Brasil and Guiana its use as ointment serves to produce intoxication (Yves d' Evreux, l. c., p. 416, Rich. Schomburgk, *Reise*, III p. 103).

[3] Tobacco was used in ancient Peru, not only as medicine, but for other purposes, as religious ceremonies (Montesinos, *Mem. antig.*, 1882, p. 16, and *Relacion anónima* in *Tres Relac. de antig. Peruan.*, 1879, p. 141), in fortune-telling (Balboa, *Histoire du Pérou*, ed. Ternaux-Compans, 1840, p. 29), and also by priests to produce ecstasy (v. Tschudi, *Culturhist. u. sprachl. Beitr. z. Kenntn. d. alten Peru*, p. 131). The medicine man of the Purus tribes produces ecstasy by snuffing tobacco (Ehrenreich, *Beitr.*, p. 69). V. Tschudi says that the Peruvian priests fell in ecstasy by the use of green tobacco leaves, and Marcoy, l. c., remarks that the snuff of the Antis was made of green tobacco leaves. Sairi (Tobacco) was the first name of the last reigning Inca. At Airaguanca, in Omasuyu, a plant called *Topasaire* (Royal tobacco) was shown to Padre Ramos

while the use of *niopo* is in general a vice. Vices often arise from abuses of medicines—medicines rarely do so from vices.

The distribution of the word *curupa* in a large area reaching from the Marañon to Haïti implies a western origin, and the word (as *curupau*) is also found in eastern Bolivia, at the foot of the Andes, as the name of the same if not an analogous plant. Though other reasons could be found to explain the fact that the word of the Omaguas for the *niopo* tree is the same as that used in eastern Bolivia, the best explanation, perhaps, would be that both terms originated in the large area uniform in its extension of the languages spoken in the Highlands of Peru.

In the environs of Córdoba in the Argentine, in place of the word *curupa* the word *sebil* was used for *niopo*. For determining the country from which the Argentine custom of snuffing *niopo* originated, the following account given of these Indians of Córdoba in the same report may serve as a guide:

"This people speak a language which they call Comechingona, and another, Zanavirona, though most of those who serve speak and converse in the general language of Peru (that is Kechua). They are people who, after their natural manner, clothed in wool of llamas, having a number of these animals, though somewhat smaller ones. . . . This people have but few rites and nearly the same as at Santiago."[1]

It seems, therefore, that the practice of snuffing *niopo* was introduced among these Indians from Peru, as were their other customs.

There is nothing published which points to the practice of snuffing the powder of *niopo* in Peru, if not in the report of the province of La Paz. In this province two powders were used as snuff—tobacco and *coro*. This *coro*, without any hesitancy, should be declared to be *curupa*, if it had not been re-

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which had been introduced there by the Inca himself (Padre Sans, *Hist. de Copacabana*, 1886, p. 9).

[1] At Santiago (de Estera) the language was also a dialect of Kechua, a useful grammar of which has been published by Miguel Angel Mossi, *Manual del idioma general del Perú*, Córdoba, 1889. It is, therefore, certain that these Indians also had similar rites as the ancient Peruvians.

ported as being a root. But the use of *niopo* being confirmed from the region of Córdoba, it seems to me more reasonable to suppose that the writer of the report was mistaken[1] than that there existed a third powder, never elsewhere reported, with a name similar to that of *niopo*, which was taken as snuff in the environs of La Paz.

In the former case it would be probable that both powders were known in ancient Peru as snuff. In the dissemination of the habit the more vicious practice would have been chosen by the wild tribes of eastern South America, instead of the milder powder which was prevalent in Peru. At least I can see no other explanation of the Argentine practice of snuffing together with the general distribution of the practice in northern South America and the great range from south to north along the Andes of the word *curupa.*

The idea of the above discussion is to remind us of the Peruvian element as having been a most important factor in the distribution of customs in eastern South America. It is a well-known fact that traces of Incasic influences are not wanting east of the Andes and far into the eastern region. It is not necessary to call to mind the infiltration by Cuzco civilization of the larger part of the Argentine, the use of the Kechua language in the upper Amazon Valley, the use of coca far on the outskirts of Incasic domination, the ancient civilization of the Omaguas, linguistic influences upon foreign tribes of the Chaco[2] and others. While this shows a wide range of Peruvian civilization, it does not prove an infiltration of the whole continent of South America. That this may have been the case has been pointed out, I believe, for the first time by Dr. K. v. d. Steinen in his observations on lexical references between the Kechua and idioms of eastern South America.[3] My supposition of all South American practices of snuffing having originated in Peru points in the same direction.

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[1] A *Clasificacion de plantas medicinales*, printed at La Paz, mentions only under No. 56 a plant *Kkuru* (that is, *Q'uru*) as a "Calmante para reumatismo."

[2] The pronoun of the second person among the Mbayas, Abipones, and Mbocobies is *acami*, according to Vater, *Mithridates*, III, in Kechua *cam.*

[3] I may here mention the word *tupa* (*tupana*) for God and thunder, common to all Tupi tribes (Omaguas, Apiacas, Tupinambas, etc.). It sounds like *tunpa* near the Andes among the Chiriguanas and Guarayas (Cardús, l. c., 247, 310, 76, etc.), which reminds one very much of the Creator and Thunder

There are many other similar problems to be studied, for instance, the concordance of the pronoun of the first person of all Arawak tribes with that of the Kechua language, the similarity of the Arawak word *yaari* for tobacco with Kechua *sairi*, and the ancient Peruvian copper axe,[1] found in a coastal river of eastern Brazil, and described by the writer, as the explanation given for its presence there by v. Tschudi (as being lost by the Paulistas) in 1887 was not entirely satisfactory.

NOTE ON THE CRITERIA OF WAMPUM.

BY DANIEL G. BRINTON, M. D.

The essays of Woodward, Hale, Weeden, Ingersoll, Tylor, Holmes, Haldeman, Hamy and others on the manufacture and uses of wampum present many facts, but, except that of Tylor, fail to attempt exact criteria for distinguishing between the different dates of manufacture. That writer divides the beads into three periods, contrasted by the method of boring and the finish of the surface.

The first period is when the bead is finished externally by rubbing the shell on a stone until the facets unite in a fairly regular outline, and the perforation is obtained by boring from each end with a stone awl; the second period, when the surface was finished in the same manner, but the perforation made with a steel awl, such as were sold by traders; and the third period, when the beads were machine-turned and drilled in the Dutch and English factories. The stone-bored beads may be assigned, in round numbers, before the year 1600; after that date the art practically fell into disuse.[2]

God *Tonapa* or *Tunuupa* in the ancient myths of the northern Bolivian Highlands (*Relac. de Santacruz, Tres Rel. de ant.*, p. 236; Bertonio, *Vocab. Cast.-Aimara*, publ. por J. Platzmann, 1879, p. 192).

[1] *Verh. der berl. Ges. f. Anthrop.*, 1887, pp. 20 and 592.

[2] E. B. Tylor in *Journal of the Anthropological Institute*, Feb., 1897, pp. 248 *sq.*

Professor Holmes doubts whether the tubular bead, which is the most common form of the wampum as seen in the celebrated "Penn belt" and other examples, is really an ancient shape. It would seem to have come in after the discovery. Unless examples from pre-Columbian graves can be adduced, all belts showing this shape, even if awl-bored and stone-polished, must rest under suspicion.[1]

Loskiel declares that shell wampum was extremely rare among the early Indians. They used beads of painted wood for their records and ornaments. Not till the Europeans sold the machine-made article did it become in any degree abundant.[2]

In a well-known passage of Roger Williams about wampum, he observes that the stone awl was no longer in use, and the introduction of the European article had already watered the value of the native article by one-half,[3]—a principle in economics which he tried in vain to make the Indians understand. This was in 1640, and it illustrates how doubtful would be a wampum belt even of that epoch. The one recently described by Prof. Hamy, and doubtfully assigned to the year 1673, is, therefore, of uncertain value.[4]

When the alleged wampum proves to be of glass beads, of course the European origin is manifest; but, as Haldeman showed by some striking examples, the specimen may date back to a time even before De Soto marched over the soil of the Mississippi basin.[5]

There seems from the above an uncomfortable doubt as to the genuine native origin of any of the wampum belts known to us, particularly as even the oldest authorities wrote after the European article had been introduced.

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[1] "Art in Shell of the Ancient Americans," in *Second Annual Report of the Bureau of Ethnology*, p. 226.

[2] *Geschichte der Mission der Evang. Brüder*, p. 34.

[3] *Key into the Language of America*, p. 176 *sq.*

[4] "Sur un Wampum," in *Journal de la Société des Américanistes de Paris* Vol. I.

[5] In *Smithsonian Report* for 1877, "On a Polychrome Bead from Florida."

AN ARCHÆOLOGICAL APPLICATION OF THE RÖNTGEN RAYS.

By Stewart Culin.

Shortly after the announcement of Dr. Röntgen's discovery the writer, in common, doubtless, with other observers, foresaw the possible value of the new rays in examining the internal construction of valuable museum specimens, and upon the establishment of suitable apparatus in the Pepper Clinical Laboratory by Dr. Charles Lester Leonard, obtained his coöperation in an endeavor to secure a practical application of value in archæological work. Among other experiments, Dr. Leonard (May, 1897) made a successful radiograph of a mummy, excavated by Dr. Max Uhle at Pachacamac in Peru. The closely-wrapped bundle, which had not been opened, was shown to contain the skeleton of a child having a string of stone or shell beads about its neck. Another radiograph of a desiccated human foot with an attached leather sandal gave promise of the utility of such pictures in the examination of similar skeletal remains.

More recently, Mr. Cushing having expressed the opinion to the writer that a piece of turquoise, explained by him as the heart of a fetishish bird, was concealed beneath the heavy wrapping of brown yarn that binds the finger loops of the prehistoric throwing stick from Mañas Cañon, Colorado, in the University Museum, it occurred to the writer that the verification of this conjecture might be secured with Dr. Leonard's aid. Photographs of the wrapping, with corresponding radiographs made by Dr. Leonard, are shown in Plates 14 and 15. It will be seen that four stone beads, presumably of turquoise, are revealed, as Mr. Cushing had indicated. I may add that the extreme fragility of the wrapping is such as to render an examination by other means impossible without serious injury to this valuable object.

COLLECTIONS AND PUBLICATIONS.

CANADA.

NEW BRUNSWICK.

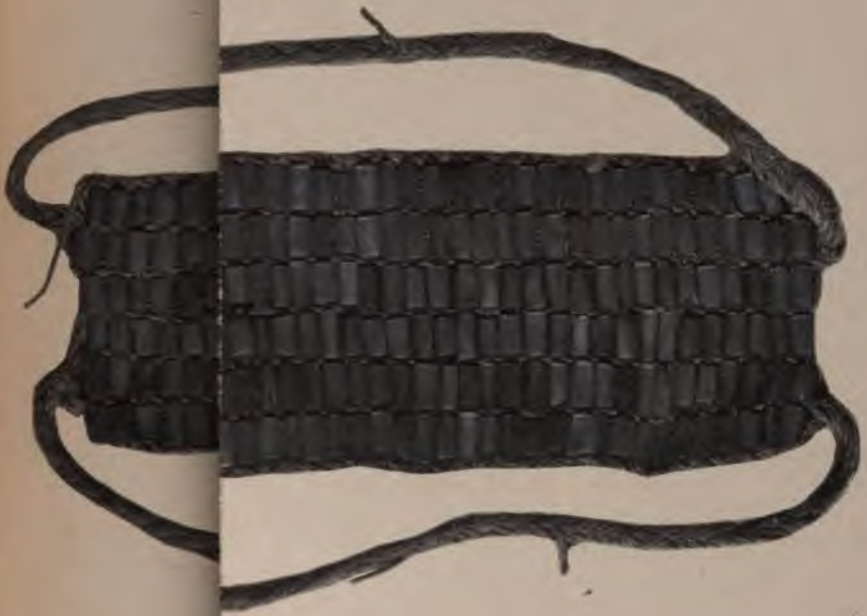
Mr. George E. Starr has deposited a wampum belt (20,126) purchased by him at an Indian village about a mile and a half north of Andover, New Brunswick, from an Indian woman named Susan Perley, a member of a tribe calling themselves the Tobique, a branch of the Micmac.

The belt or necklace, Plate 16, consists of six strands of blue and white shell beads, strung on cotton thread. Each strand originally composed 97 beads, but one bead has been removed from the top strand, two from the second, three from the third, and four from each of those below, making the actual number 563 (582—19). The length of the belt is 11½ inches, and, including the threads, 21½ inches.

Mr. Starr's wampum belt belongs to one of the class of such objects called " missionary belts." The cross in the centre indicates this. It is in the Greek form, which is also seen in the celebrated " Jesuit missionary belt " of the Hurons. (See Hale in *Journal of the Anthropological Institute,* vol. xxvi, p. 240.) The triangular figures in white beads on each side of the cross probably represent church steeples and are thus symbolical of two parishes. The general significance of the belt would be to perpetuate the memory of the friendly alliance of two Christian communities among the Indians. (D. G. Brinton.)

Mr. Starr has also deposited a conical beaded cap of bayeta (20,127), 16¾ inches in height, and a pair of bayeta leggings (20,128), concerning which Mr. Cushing writes as follows :

"The Micmac capote and leggings received yesterday are of great interest. Although made of dark red bayeta in place of stained buckskin, and although decorated with appliqué borders of silk and with edgings of fine bead work, they are essentially primitive alike in cut and embellishment. The hood, for example, resembles the hoods of the peasantry of Europe: but



essentially primitive alike in cut and embellishment. The hood, for example, resembles the hoods of the peasantry of Europe; but it is really an arctic style of headgear, common alike to the tribes of Siberia and to the Eskimo of our own far North. Again the silk appliqué patterns may be seen to resemble closely the highly colored and bright and identically treated skin facings on the garments of Eskimo women; while in the shape of the leggings and their edgings of fine beads may be seen combined with arctic types the porcupine quill work and footless leg gear of mid-American Indians."

MEXICO.

Mr. Charles H. Snyder has presented three effigy vases (20,991–93), from between Oaxaca and Mitla, Zapoteca.

HONDURAS.

Dr. Gustav Niederlein has presented a string of beads (20,986), bones, seeds, nuts, etc., from the Xicaques Indians, and an ancient carved stone head (20,987) from the Department of Santa Rosa de Copan.

THE FAR EAST.

CHINA.

The following images, collected by Mr. Sheridan P. Read, late U. S. Consul at Tientsin, have been deposited by Dr. William Pepper:

20,943. Kwan Yin, the Goddess of Mercy, holding a scroll and seated on clouds. Cast bronze, gilded. Height, 7 inches.

20,944. Kwei Sing, one of the gods of Literature, seated, holding a pencil in the right hand and an ingot in the left. Cast bronze, with traces of paint and gilding. Height, 11¾ inches.

THIBET.

20,945. Padmapani (Thibetan, *Chenresi*) or Avalōkitsevara, the protective divinity of Thibet. Seated image of brass, inlaid with turquoises. Height, 7 inches.

20,947. Padmapani. Seated image of bronze, gilded. Height, 7½ inches.

20,948. Shakya-thub-pa (Shakya-muni). Image of gilded bronze, seated on lotus. Height, 7¼ inches.

20,949. Shakya-thub-pa. Image of bronze, seated on lotus. Height, 6¾ inches.

20,946. The goddess Doljang, the deified consort of King Srongtsan Gampo (617–698 A. D.). Seated image of stamped copper, 9½ inches in height. The hollow body is closed at the bottom with a copper plate engraved on the outer side with a symbol composed of four Dordje arranged with the Chinese Tai Ki in the centre. The image contained the following objects: A flat package of fine wood dust intermixed with small fragments of twigs wrapped in yellow paper; eleven rolls of paper written with Thibetan texts in red ink, from 1 inch to 3½ inches wide, all tightly enfolded in yellow silk; two similar long strips of paper written in red with Thibetan texts and enfolded in yellow paper in flat packages, and five disks of paper, 1½ inches in diameter, imprinted in red with magical symbols. The latter are also wrapped in yellow paper. These objects were held in place by a pyramidal plug of wood, 6½ inches in length, covered with yellow silk.

SPECIAL COLLECTIONS.

Fans.—Mrs. Lucy Wharton Drexel has made the following additions to her collection:

Vellum fan, portrait and autograph of Madame Modjeska, painted by William F. Kline (20,940); three round fans, Japan, advertisements of tea houses (21,010–12); round fan, Japan, advertisement of *gaisha* named Shima Fugino (21,013); folding fan, *ogi*, from the monastery of Rokuyen-ji, Kyoto (21,016); large folding fan, *ogi*, Japan, painted with dragon and bamboo, by Shōjō Kiyōsai, an artist of high reputation, lately deceased, celebrated for his pictures of monkeys (21,017); round fan with picture of Suzumé, Japan (21,021); Shinto priest's fan, Japan (21,022); umpire's fan, Japan (21,023); straw fan, made at Arima, Japan (21,028); *ngá shín*, "official fan," cut from slice of palm-tree, with burnt designs, horn handle, Canton, China (21,024); *shau sz' küm shín*, "longevity characters silk fan," circular, embroidered with peacock, Canton, China (21,025); *kung shín*, "palace fan," paper, leaf shaped, Canton, China (21,026); woven palm-leaf fan, Samoa, (21,027).

Fire-Making and Lighting.—Mrs. Isaac Gross, of Sunbury, Pa., has presented a fat lamp (20,920).

Henry D. Paxson has presented a jacket or petticoat lamp (21,050) purchased at a hardware shop in Philadelphia. The vender, Paul J. Field, states that it was still used in 1866 by boiler-makers, machinists, and engineers as a portable light, and consumed lard or sperm oil.

Games.—Professor G. Wharton James, of Pasadena, California, has presented a photograph (20,952) of girls playing the game of *Hue-ta-queé-che-ka*, of the Havasupai Indians of Arizona, accompanied by the following description: "Squatted around a circle of small stones, the circle having an opening at a certain portion of its circumference, called the *Yam-se-kyalb-ze-ka*, and a large flat stone in the centre, called *Taă-be-che-ka*. The Havasupai Indians play the game called *Hue-ta-queé-ehe-ka*. Any number of players can engage in the game. These players are chosen into "sides." The first player begins the game by holding in his hand three pieces of short stick, white on one side and red on the other. These sticks are called Toh-be-ya, and take the place of our dice. Rapidly they are flung upon the centre stone—*Taă-be-che-ka*—and as they fall counts are made as follows:

3 whites up,	10
2 whites and 1 red up,	2
2 reds and 1 white up,	3
3 reds up,	5

Tallies are kept by placing short sticks between the stones—"hue"—that compose the circle, one "side" counting in one direction from the opening *Yam-se-kyalb-ye-ka*, and the other "side" keeping tally in the opposite direction.

Of late years this game has been one of the most popular forms of gambling with the Havasupai, and even the girls now play it, gambling for safety-pins or other girls' treasures.

A set of beaver-teeth dice (20,955) from the Klikitat Indians of Washington, collected by A. B. Averill, have been obtained by purchase.

Harry J. Abbott, Esq., has presented a pack of the Queen's Jubilee Cards (20,990), Goodall's Victoria Cards, London, 1897.

Numismatics.—Howard N. Potts, Esq., has presented fourteen American, thirty-nine British, and fifty-three coins of other countries in the name of Mrs. Mary Adelaide Potts.

Mr. Victor D. Brenner, of New York City, has presented his bronze medal (21,049) issued by The American Numismatic and Archæological Society of New York City to commemorate the twenty-fifth anniversary meeting of the National Conference of Charities and Corrections.

Mr. Alfred C. Harrison has presented two notes of the Bank of the United States, December, 1840, for $2,000 (21,008) and $3,000 (21,009).

LIBRARY.

The following are among the most important acquisitions since the last issue of the BULLETIN:

"Galerie Americaine du Museé d'Ethnographie du Trocadero, choix de pièces archéologiques el ethnographiques décrites et figurées par le Dr. E. T. Hamey, 2 éme partie."

Gift of *M. le Duc de Loubat.*

Compté Rendu de la Congrès International d'Anthropologie and d'Archæologie Préhistoriques," 7th session, Stockholm, 1874. 2 volumes, Stockholm, 1876.

Gift of the *Royal Academy of Belles-Lettres, History, and Antiquities of Stockholm.*

"A Dictionary of the Cree Language." By the Rev. E. A. Watkins. London, 1865.

Gift of *Mr. C. V. Alloway,* Winnipeg, Manitoba.

LECTURES.

CURIOSITIES OF AMERICAN COINAGE.

By Alex. E. Outerbridge, Jr.[1]

It is remarkable, in view of the universal desire of mankind to obtain money, that so few persons, comparatively, really know anything about the early history of money, or the social and industrial conditions which led, long ago, to the substitution of pieces of coined money for direct barter, in short, when, where, and how, the art of coining and use of metallic money originated. These are interesting subjects for historical and archæological research, and they have a direct practical relation to the development of the modern science of money. Elsewhere I have gone over this classical ground, and I propose, on this occasion, to limit the field to be surveyed to that portion of the subject which relates particularly to the early history of American coinage and its modern developments. There are many curious and important facts relative to this coinage with which the people are either wholly or in part unacquainted.

My subject will be comprised under four heads, viz.: 1. The functions of money; 2. The early Colonial coinage; 3. The coinage by private individuals or companies; 4. The National coinage.

THE FUNCTIONS OF MONEY.

In "Money and the Mechanism of Exchange," Professor Jevons relates an amusing experience of a Parisian singer who made a professional tour of the world some years ago. In crossing the Pacific Ocean the steamship was unexpectedly compelled to call at the Society Islands, where she was detained for a day or two. A few foreigners who were there invited the singer to give a concert, agreeing that she should receive one-third of the gross proceeds. The lady accepted the invitation, and the concert was well attended by the natives, who came from all parts of the islands. When the receipts were counted the lady found that her share consisted of several pigs, fowls, goats, and a large quantity of bananas, cocoanuts, and other tropical fruit. There was very little money in circulation on the islands, and as Mademoiselle could not consume any considerable portion of her share of the proceeds of the concert it became necessary to feed the live stock with the fruit.

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[1] A lecture delivered in the Museum of Science and Art, University of Pennsylvania, March 23d, 1898.

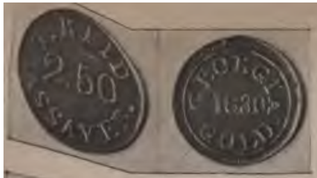
This story is told to illustrate a difficulty which arose in the earliest commercial transactions from the want of a common medium of exchange, which difficulty led to the invention (about 700 B. C.) of coined money as a "go-between" or substitute for direct barter.

At the first glance it might appear a simple matter for the butcher, the farmer, or the miller to make due exchange of commodities without the intervention of the go-between called money, but a little reflection will soon reveal at least three great difficulties: First, that of finding two persons whose disposable goods mutually suit each other's wants; second, the impracticability of subdividing many articles; for example, a tailor cannot cut up a coat into small portions without destroying its value; third, the complexities involved in equitably adjusting the relative values of various commodities. These and other difficulties led to the selection, quite early in the history of civilization, of certain substances which, by common consent, were received by all persons in exchange for all commodities at certain rates by mutual agreement. A curious variety of materials have, at different times, and in different countries, served this useful purpose, and it is evident that such substances would soon come to possess the two great functions of money, viz.:

1. A common medium of exchange.
2. A common measure of value.

In the most primitive age the skins of wild animals were usually selected, being both useful and portable. Even in the early part of this century the business of the Hudson Bay Trading Company was transacted with the North American Indians entirely on this basis; a gun, for example, was valued at "twenty beaver skins." In Massachusetts (and other colonies)

PLATE No. 1.—PRIVATE ISSUES OF GOLD COINS.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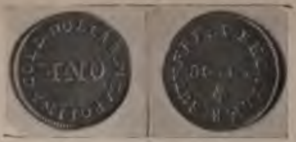
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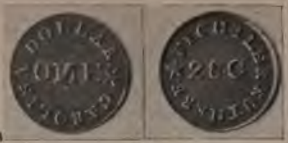
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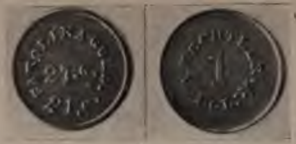
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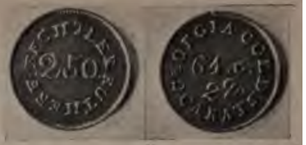
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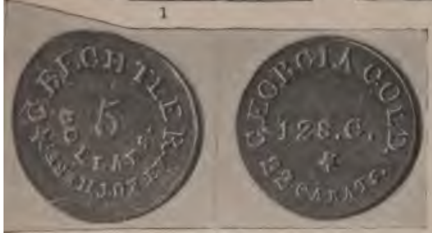
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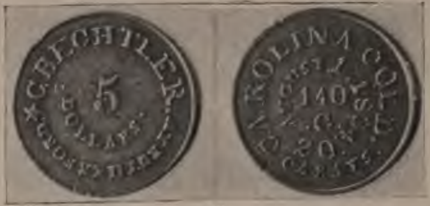
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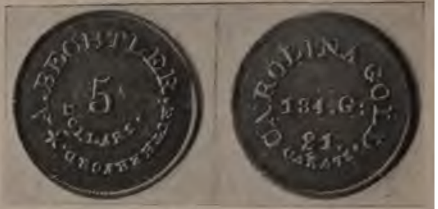
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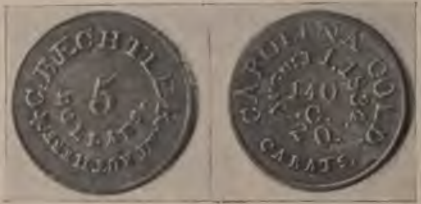
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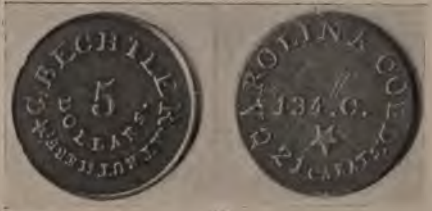
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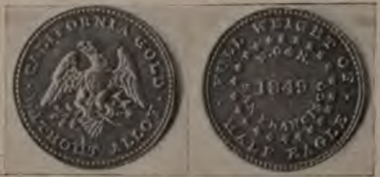
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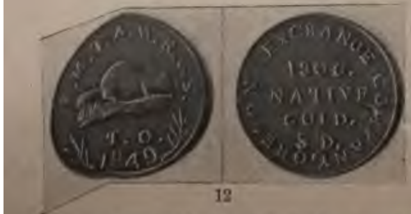
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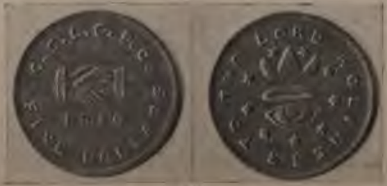
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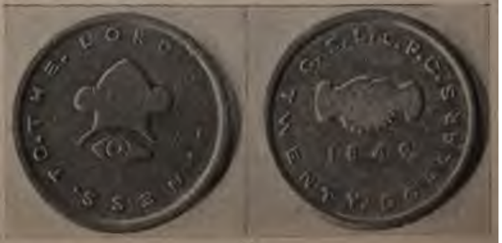
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No. 1. $2.50 gold piece. T. Reid. Georgia gold, 1830.
2. $1.00 gold piece. N. Carolina gold. C. Bechtler.
3. $1.00 gold piece. Carolina gold. Bechtler.
4. $1 00 gold piece. Carolina gold. A. Bechtler.
$2.50 gold piece. Georgia gold. Bechtler.

No. 6. $5.00 gold piece. Georgia gold. C. Bechtler.
7. $5.00 gold piece, Carolina gold. C. Bechtler.
8. $5.00 gold piece. Carolina gold. A. Bechtler.
9. $5.00 gold piece. Carolina gold. C. Bechtler (20 carats).
$5.00 gold piece. Carolina gold. C. Bechtler (21 carats).

No. 11. $5.00. California gold. N. G. & N., 1849.
12. $5.00. Oregon Exchange Co., 1849.
13. $5.00. Utah (Holiness to the Lord), 1850.
14. $20.00. Utah (Holiness to the Lord), 1849.

prior to the Revolution specie was at times so scarce that laws were passed legalizing the payment of taxes in skins, cattle, and farm products.

It is said that in the mountainous districts of Kentucky, skins are used even to this day as currency to a limited extent by the natives.

In Massachusetts a law was enacted, March 4th, 1634, as follows: "It is likewise ordered that muskett bulletts, of a full boare, shall pass currantly for a farthing a-piece, provided that noe man be compelled to take above XII pence att a tyme in them."

EARLY COLONIAL COINAGE.

The inconvenience experienced from the want of specie caused the colony of Massachusetts to establish a mint as long ago as the year 1652; this was exactly 140 years before the establishment of the National Mint in Philadelphia. The Massachusetts law provided for the coinage of "shillings," "6 pence" and "3 pence," all of sterling silver, that is, 925 parts of pure silver and 75 parts of copper; the law stipulated that the coins were "to be reduced in weight 2 pence in the shilling less than the English coin." A curious mistake occurred in the calculation whereby these shillings were made 5½ grains too light, but they served a good purpose notwithstanding. The device upon the coins is a "pine tree," and the Massachusetts pine-tree shillings are now so rare that they are only to be found in cabinets of coins.

The British Government opposed the establishment of this mint, as it did in fact all manufacturing industries of every kind in the colonies, but the mint continued in active operation for over thirty years and Maryland soon followed Massachusetts' example. These were the only silver coins issued before the Revolution, but several other American colonies issued copper coins. After the Revolution silver was coined by the different States, and even by private individuals, and very soon after peace was established Congress began agitating the subject of a national coinage. Robert Morris, the financier, was directed to present a scheme of coins and currency. His first report (prepared by the assistant financier) was presented in 1782 and it proposed a decimal system, which has been adopted, but all the other features were discarded, chiefly on account of the diminutiveness of the proposed "unit," which was only one-tenth of a penny. Jefferson said in the discussion "a horse or bullock of $80 value would require a notation of six figures, to wit: 115.200 units." A few years later Jefferson himself presented a report proposing the Spanish milled dollar as a suitable unit, as this coin was very familiar to the people and of a convenient size; these proceedings were under the "confederation" and one of the articles of the original compact permitted coinage "by the respective States." Vermont, Connecticut, Massachusetts, and other States issued coins under this arrangement for a few years, until the Constitution in 1787 vested the right of coinage solely in the General Government.

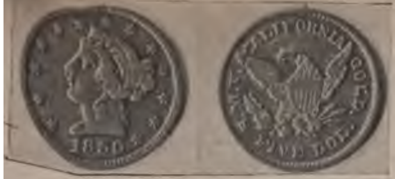
For some reason, not known, the code of laws for establishing the National Mint was not formulated until five years later.

The Act of April 2, 1792, provided for the establishment of a Mint, and for the coining of ten, five, and two-and-a-half dollar gold pieces; also one dollar, one-half, one-quarter, one-tenth of a dollar in silver; one cent and half-cent in copper.

Copper coins were struck at the Philadelphia Mint in 1792, some of these bore the head of Washington on one side, but he disapproved of the device and suggested the substitution of the head of Liberty. Since that time no American coin has ever displayed the head of any individual.

COINAGE BY PRIVATE INDIVIDUALS AND COMPANIES.

An exceedingly interesting curious, and, indeed, inexplicable feature of the early history of coinage of money in America, regarding which there is but little accurate information available at the present day, is the issuing, on a large scale, of gold, silver and copper coins (also "tokens") by private individuals and by trading companies. It will surprise many, no doubt, to learn the extent to which this practice was carried, and that it was permitted to exist until a comparatively recent period, notwithstanding the express prohibition in the Constitution of all such acts.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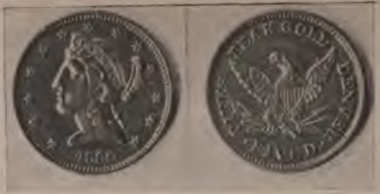
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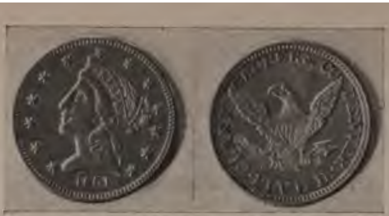
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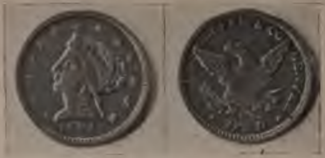
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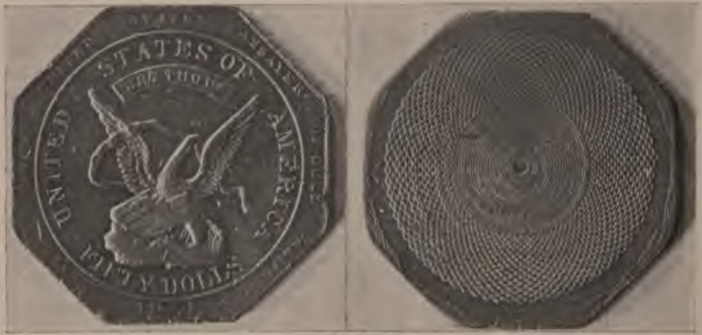
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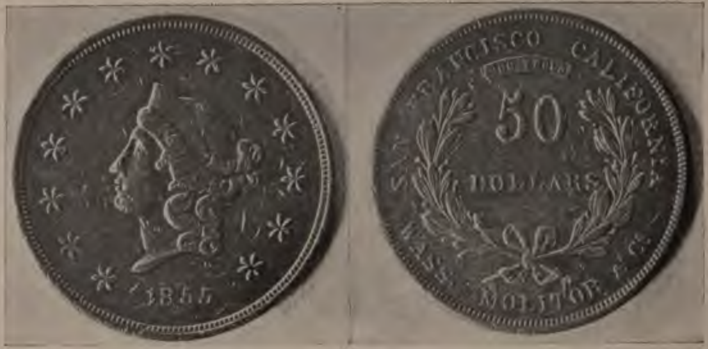
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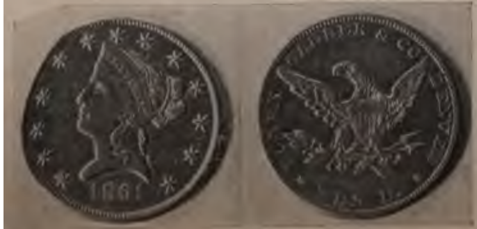
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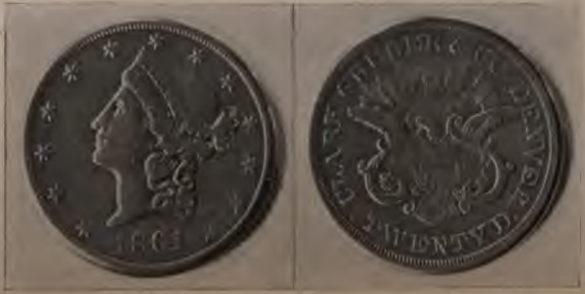
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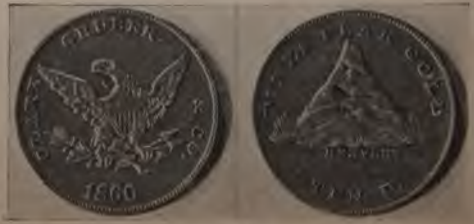
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No. 15. $5.00. California gold. S. M. V., 1850.

No. 18. $2.50. Clark Gruber & Co., Denver, 1861.

No. 21. $10.00. Clark, Gruber & Co., 1861. Denver.
22. $20.00. Clark, Gruber & Co., 1861. Denver.

In a report made to Congress by the Director of the Mint (Dr. Patterson) in 1840, these words may be found:

"Coinage of gold and silver, though withheld from the State, is freely permitted by individuals."

In 1850 the assayers of the Mint (Eckfeldt and Du Bois) reported: "There are several classes of gold coins which are struck within the national boundaries, but are not of the United States; these are Bechtler's coins of North Carolina and the California coins."

In 1851 the assayers reported that twenty-seven different kinds of gold coins, issued from fifteen private mints, had been received and assayed at the United States Mint in Philadelphia.

The earliest private coinage intended for use in the colonies of America (except the Bermuda "hog" coins) is known to numismatists under the general name "Rosa Americana," and the story connected therewith is most remarkable. In the year 1722, Mr. Wood, an iron founder of Wolverhampton, England, claimed to have discovered an alloy suitable for coins, consisting of copper, zinc and a small proportion of silver. Through the influence of a favorite of George I, known as the "Duchess of Kendall," a patent was issued by the King, dated July 12, 1722, together with a "Royal license," which was to continue for fourteen years, for coining "tokens" for Ireland and the colonies of North America to a large extent, viz., "three hundred tons;" the amount of the Irish coin was limited to £105,000, a great sum at that day.

A small royalty of £100 a year was to be paid into the King's exchequer and a salary of £200 to an officer of the Crown, called the "Comptroller." Sir Isaac Newton, then the Director of the Royal Mint, was chosen for this office, and he served for a short time, when he nominated a nephew, who succeeded him.

Thousands of Wood's base metal coins were struck for use in Ireland, and the issue would probably have been accepted by the people without question, had it not been that Dean Swift, then living in seclusion, saw in this scheme an opportunity to attack the English Government, and by his "Drapier's Letters," his poems, and other writings, all anonymously published, in which he mercilessly lampooned the scheme and all those who were in any way connected with it, he aroused a storm of fury that is said to have been "indescribable." A writer of the day said: "All parties, Catholics and Protestants, Whigs, Tories, Orangemen and Rapparees, were equally frantic. Merchants publicly announced they would not accept the coin, the very hawkers and link-boys refused it, declaring it would buy neither ale, tobacco, nor brandy. Wood's effigy was dragged through the streets of Dublin and burned. ... . The Privy Council offered a reward of £300 for the discovery of the author of the 'Drapier's Letters.'"

The King then ordered the proposed issue to be reduced to £40,000, but this did not assuage the excitement in the least, and it finally became necessary, in order to restore peace, to buy back the Royal license from Mr. Wood, by the payment to him of a pension of £3,000 a year for fourteen years.

This failure did not, apparently, kill the project for coining money for the American colonies, and the many pieces actually struck for that purpose are creditable specimens of the art at that period. On the obverse appears the head of the king and on the reverse a full blown rose, with the legend, "Rosa Americana," and the date "1722." On the later issues the head of George II appears and the date, 1733.

There is preserved in the Massachusetts archives a letter of instructions, dated October 29th, 1725, from the Duke of New Castle to the Governor of Massachusetts, saying:

> Sir, His Majesty having been pleased to graunt to Mr. Wood his letters patent for the coining of two pence and half pence pieces of the value of money of Great Britain for His Majesty's dominions in America, which said coin is to receive such additional value as shall be reasonable and agreeable according to the customary allowance of exchange in the several parts of His Majesty's dominions, as you will see more at large by the patent which will be laid before you by the person that delivers this letter to you, I am to signify to you His Majesty's pleasure that in pursuance of a clause in said patent by which all His Majesty's officers are to be aiding and assisting Mr. Wood in the due execution of what is therein directed and in the legal exercise of the several powers and enjoyment of the privileges and advantages thereby graunted to him, you are to give him all due encouragement and assistance and that you and all such other of His Majesty's officers there, whom it may concern, do readily perform all legal acts that may be

requisite for that purpose. This I am particularly to recommend to your care, and to desire your protection to Mr. Wood and to those whom he shall employ to transact this affair in the Provinces under your government.

I am Sir
Yr Most Humble Servant
NEW CASTLE.

If we may rely upon the statement of an English writer of the day Mr. Wood's coin did not meet with a very cordial reception in America, for the pamphlet says:

> "Wood obtained a patent for coining small money for the English plantations in America in which he had the conscience to make 13 shillings out of 1 pound of brass, this money they rejected in a manner not so decent as that of Ireland."

In the year 1830 Mr. Templeton Reid, of Georgia, established a private mint at which he coined $10, $5, and $2.50 gold pieces; these circulated freely through the South, and they were brought to the U. S. Mint in Philadelphia for deposit and re-melting in quantities. The assayer reported in 1842 that the $10 gold pieces of T. Reid weighed 248 grains, contained 942 parts of pure gold in 1,000 parts of metal, and the intrinsic value slightly exceeded the nominal value, being worth $10.06. These coins are now quite rare.

In 1831 Christopher Bechtler of Rutherfordton, N. C., followed Mr. Reid's example on a larger scale, and in a few years he had issued several million dollars worth of gold coins of denominations of $10, $5, $2.50, and $1.[1]

In 1842 the Mint assayers stated that "coining is still carried on by Bechtler, although there is a branch United States Mint less than eighty miles distant." This was located at Charlotte, N. C.

In 1851 the assayers reported that "several of the private issues of gold coins from California are close imitations of the national coin; some assay nearly up to the nominal value, but many fall below." A $10 piece of the Pacific Company only yielded $7.86 in gold. A lot of different denominations aggregating $562.50, nominal value, yielded at the Mint in Philadelphia $479.20.

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[1] In 1840 Mr. Bechtler stated that the amount of his coinage to date was $2,241,840.

One interesting gold coin, a $50 piece (some were octagonal), issued by Aug. Humbert, United States Assayer at San Francisco, yielded the full nominal value. All of these private issues have now been stopped, and strict laws have been passed punishing any attempt to imitate the coins of the nation; even the toy money formerly made for children of gilded paper has been prohibited by the government authorities.

THE NATIONAL COINAGE.

The Mint was established in Philadelphia in 1792 and in its first year issued copper coins only, coining of the other denominations of money, as already named, commenced in 1793.

Many persons believe that the so-called "Dollar of the Daddies," weighing 412½ grains (nine-tenths fine), having a ratio to gold of "16 to 1" in value when first coined, was the original dollar of the Constitution. This is, however, erroneous. The 412½ grain silver dollar was not authorized until forty-five years later. The original silver dollar weighed 416 grains, and the ratio of silver to gold was 15 to 1, not 16 to 1.

Several modifications in weight and fineness of both gold and silver coins were made during the first few years, prior to the Act of January 18, 1837, which greatly simplified the coinage by adopting the French decimal system, including a uniform "fineness" or proportion of 9 parts of gold to 1 part of copper for the gold coins, and the same proportion of silver and copper for the silver coins; the weights of the gold and silver coins were, at the same time, readjusted so as to make the ratio "16 to 1" between silver and gold.[1]

The total issue of silver dollars coined under the Acts of 1792 and 1837 until 1873, when the coinage was dropped, amounted to $8,031,238. When the Bland Act was passed, in 1878, the silver in the silver dollar weighing 412½ grains was worth 89.1 cents; to-day the silver in the same dollar is worth about 42.5 cents. In the first four months after the Bland bill was passed 8,573,500 Bland dollars were coined, or more than the entire issue of the old silver dollars in eighty years. In the same year also the Mint coined 11,378,610 "trade dollars" which weighed 7½ grains more than the Bland dollars, but were not "legal tenders,"[1] and, though issued by the United States Mint, were refused by the United States Government in the payment for postage stamps, taxes, or for other dues, while the Bland dollar, of lesser intrinsic value, was a legal tender and good for payment of all debts. The total issue of trade dollars between 1873 and 1879 was 35,965,924, and the total issue of Bland dollars, from 1878 to the close of the fiscal year 1897, was 451,993,742.

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[1] The original silver dollar, authorized under the Act of April 2, 1792, contained 892.4 parts of pure silver in 1000 parts of metal and weighed 416 grains. The Act of January 18th, 1837, changed the proportion of silver to 900 parts in 1000 and the weight to 412½ grains, the amount of pure silver thus remained unchanged.

The following table shows the total coinage value of all denominations of silver coin from the establishment of the United States Mint in 1792 to the end of the last fiscal year, June 30, 1897:

Dollars	1792 to February 12, 1873	$8,031,238 00
	1878 to June 30, 1897	451,993,742 00
Trade Dollars		35,965,924 00
Half "		134,033,195 00
Columbian Half Dollars		2,501,052 50
Quarter Dollars		52,395,052 00
Columbian Quarter Dollars		10,005 75
20 Cent Pieces		271,000 00
10 " "		29,428,613 90
5 " "		4,880,219 40
3 " "		1,282,087 20
Total		$720,792,129 75

It thus appears that the Bland dollars coined since 1878 exceed in coining value all the other issues of silver money from the establishment of the Mint, in 1792, to the present day.

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[1] The act of Feb. 12th, 1873, made the trade dollar a "legal tender in sums not exceeding $5.00; this legal tender quality was withdrawn by the joint resolution approved July 22d, 1876, and the coinage was limited to such amount as the Secretary of the Treasury should consider sufficient to meet the export demands."—*United States Treasury Department Circular No. 143.*

Although Congress appropriated a sum of money ($40,000) to "pay the freight" on Bland dollars from the Mints, or Sub-Treasuries, to any part of the country, the government has never succeeded in getting more than a small proportion of the vast accumulation of Bland dollars into circulation. It became necessary, therefore, to construct enormous storage vaults of steel, some of which will hold more than one hundred million of these dollars. The depreciation in market value of silver in the Bland dollars and uncoined bars is estimated to be about $200,000,000.

The dropping of the original 412½ grain silver dollar from the law of 1873 was purposely done in order to make a place for the new silver coin called the "trade dollar," ostensibly intended for foreign trade only, actually put into circulation to a large extent at home at a profit to silver owners, the "free coinage" privilege and falling market value of silver made these transactions remunerative. Some people who accepted the trade dollars in good faith suffered loss.[1] This was the first entering wedge of the silver speculation which has attained such gigantic proportions.

The first coinage of the country was, in a measure, experimental; there were several different and very complicated finenesses, or proportions of precious metal and alloy used. Then, in 1837, an admirably simple system of coinage proposed by Dr. Patterson was established. Later on various more or less absurd ideas were advanced and experiments were tried, such as the "goloid" dollars, consisting of silver and gold in proportions of 24 to 1 and 15½ to 1, invented and patented by

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[1] Under the act of Feb. 19th, 1887, holders of trade dollars were permitted to exchange them for "Bland" dollars if presented at the Treasury, or any sub-treasury, within six months from that date. Less than one-fourth were thus redeemed, (7,689,036), and since the expiration of the period of redemption, trade dollars have been purchased as bullion, at the market price of silver, when presented at the mints. Although containing more silver than the Bland dollar, the trade dollar is worth less than half as much, owing to the low price of silver.

Dr. W. W. Hubbell. Specimens of these freak coins were struck at the Philadelphia Mint in 1878.[1]

At the time that Congress was engaged in formulating laws for the establishment of the Mint and the regulation of the coinage in 1792, the production of silver in this country was insignificant in amount. From 1845 to 1857 inclusive, the silver output is estimated to have been about $50,000 each year. As long ago as the year 1853 the production of gold amounted to $65,000,000 and the annual output has never equaled that amount since that time. In 1860 the silver product amounted in value to $150,000. In 1861 it jumped suddenly to $2,000,000, in the following year to $4,685,000, in the next year to $8,500,000, and so on, by leaps and bounds, until, in 1878, we were turning out about $45,000,000 worth of silver (commercial value) per annum. This was the real reason why the Bland bill for the restoration of the old silver dollar, weighing 412½ grains, was introduced into Congress and passed over the President's veto. It was then supposed that a maximum output of silver had been attained, but this was far from the fact. Production increased amazingly even in the face of falling prices.

In 1878, the year the Bland bill became law, the average price of pure silver was $1.15 an ounce, and the output from American mines was less than 35,000,000 fine ounces. In 1896 the average value of an ounce of fine (pure) silver was 67 cents, but the output of silver had risen to nearly 59,000,000 fine-ounces. Since that time the price of silver has fallen still lower; to-day it is about 55½ cents per ounce.

In 1837, when the 412½ grain silver dollar was authorized, the pure silver contained therein (371¼ grains) was worth 100 cents in gold. To-day the pure silver in the Bland dollar is worth 42½ cents.

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[1] Two different designs of goloid coins were struck:

1. The "goloid dollar," having the head of Liberty and motto "E Pluribus Unum" on the obverse, while on the reverse the following figures appear: 1 gold, 24 silver, .9 fine, 258 grains.

2. The "goloid metric dollar," having similar design on the obverse, and on the reverse the following figures: 15.3 gold, 236.7 silver, 28 copper, 14 grammes.

Proof specimens of these coins are preserved in the cabinet of the Mint in Philadelphia.

The value of any raw product depends mainly upon the relation between the production and consumption; when this remains constant the price of the commodity varies but little.

The commercial ratio of silver to gold has been carefully determined by Dr. A. Soetbeer, the renowned statistician, from the years 1687 to 1832; by Pixley and Abell from 1832 to 1878, and after the latter date by the daily cablegrams from London to the Bureau of the Mint. These tables show that the ratio between silver and gold vibrated between the limits of a trifle below 15 to 1 and 16 to 1 for nearly two centuries. In 1873 the ratio was almost exactly 16 to 1, then the great flood of silver began to pour out from the famous Comstock lode and other mines in the West, so that production soon far exceeded consumption. The government was compelled by the "Bland" Act of February, 1878, to purchase silver at the rate of "not less than $2,000,000 worth per month." This continued without interruption for twelve years (from 1878 to 1890) during which time more than four hundred million silver dollars were coined. The Sherman Act, repealing the coining of the Bland dollars, really made matters worse, in some respects, as it authorized the purchase by the government of not less than 4,500,000 ounces of silver per month, and 168,674,682.53 fine ounces were purchased in four years (1891–1894) at a cost to the government of $155,931,002.25, under the act of July 14th, 1890. The average price paid for this silver was almost 92½ cents per ounce. At the present market price (55½ cents per ounce) there is a depreciation in value of $62,316,553.45 on the silver pigs purchased under this act. Notwithstanding these heroic efforts to sustain the price of silver through the compulsory purchase by the government of such vast quantities of the metal, the flood continued rising higher and higher while the price descended lower and lower, thus proving that silver obeys the law of all commodities, and that any attempt to sustain the price by artificial means, even when backed by such a rich and powerful government, and carried out on such a great scale, must surely fail.[1]

COINING OF GOLD.

If the question should now be asked you, "What denomination of gold money of the United States has been most largely coined since the establishment of the Mint in 1792?" you would probably say the "gold dollar, of course." The answer would be wrong—very wrong. Less than twenty million gold dollars in all have been struck, and their coinage has been entirely discontinued for nearly ten years. If, on the other hand, the question should be asked, "Which denomination of gold money has been coined most sparingly?" you would probably say, "the double-eagle." Again the answer would be wrong.

Although the double-eagle was not authorized until 1849, fifty-seven years after the Act which authorized the eagle, half-eagle and quarter eagle, more double-eagles have been coined than of any other denomination of gold, and the intrinsic value thereof is more than twice that of all the other gold coins put together. The total value of all gold coined in the United States Mints, except the double eagles, from the organization of the Mint in 1792 to June 30, 1897, is $548,840,918. The value of the double-eagles coined since 1850 (the first year of their coinage) to June 30, 1897, is $1,337,498,040.

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[1] Circular No. 143 (dated July 1st, 1897), issued by the United States Treasury Department, says, p. 63: "The stock of gold and silver in the world in 1873 and 1896 is estimated to have been as follows:

	1873.	1896.
Gold	$3,045,000,000	$4,100,000,000
Silver	1,817,000,000	4,200,000,000

The commercial value of silver in 1896 was less than one-half of its value per ounce fine in 1873; notwithstanding this great fall in price, the estimated value of silver in the world in 1896 exceeded the estimated value of gold at that time, while in 1873 the estimated value of silver was only 59½ per cent. of the estimated value of the gold in the world.

Stated in other terms, the gain in estimated value of gold is 34.65 per cent., while the gain in estimated value of silver in the same period is 131 per cent.

A circular issued by the United States Treasury Department says: "The total coinage of gold by the Mints of the United States from 1792 to June 30, 1897, is $1,886,338,958, of which it is estimated that $671,676,250 is now in existence as coin in the United States." The pamphlet explains in detail the basis upon which the estimate of the gold coin in the United States was established, and says: "It will be seen that more than two-thirds of the gold coins struck at the mints of the United States have disappeared from circulation." This is an astounding statement. What has become of all this vast store of gold, amounting in value to $1,214,662,708, or more than 90 per cent. of the value of the entire issue of double eagles?

It is not a mere theory of mine that the disappearance from circulation of about two-thirds in value of all the gold coins struck at the Mints of the United States is due in part to the preponderance of coinage of double eagles. Thirty-seven years ago the Director of the Mint called attention to the matter in his official report as follows: "The chief design of a National Mint is to subserve the interests of the people at large preferably to a few large owners of bullion or coin. The interests of the public and of depositors are not always concurrent in the matter under discussion. . . . The plain effect of issuing gold coin of a large size is to keep down the circulation of specie, and increase the use of paper money."

In the Director's report for the year 1880 I find the following: "In Great Britain the gold coinage consists almost wholly of sovereigns and half-sovereigns; in France, of twenty and ten-franc pieces; and in Germany of ten-mark pieces, all of these coins being of less value than five dollars. The absorption by France of $1,100,000,000 of gold imports into her circulation during the thirty years from 1850 to 1880 may in part be accounted for by the coinage of nearly all this gold into denominations of less than two and four dollars value."

The average coinage value of double-eagles during the past four years has been over $44,000,000 a year, as compared with a yearly average value during the same period of about $10,000,000 in eagles, $4,000,000 in half eagles, and $30,000 in quarter eagles! It thus appears that we are still coining two-thirds of our gold into double-eagles that never pass into circulation and disappear immediately.[1] If, instead of pursuing this short-sighted policy for so many years, the people had been encouraged, by the issue of small denominations; on the return to specie payments in 1879, to circulate gold instead of paper, the gold could not have been so readily drained away from this country to foreign lands, as has unfortunately happened on a great scale during the past few years.

If these words shall produce any impression upon those in authority, and thus lead to a modification of our coinage laws or customs in this regard, the attempt I have here made to combine with an academical discussion of the curiosities of American coinage some practical suggestions for improvement therein may not prove altogether futile.

For nearly fifty years we have been coining double-eagles (not to mention eagles) that are, as a rule, immediately shipped to Europe; there they go at once to the melting-pot, and are converted into British sovereigns (having a different proportion of alloy) or into gold coins of other nations; as soon as the rate of exchange changes beyond a certain degree these brand-new foreign gold coins are to some extent shipped back to us, and they in turn go to the melting-pot at the Mint, where the proportion of alloy is again changed to make the standard of the United States (9-10 fine). The gold is then recoined, shipped back to Europe, and so the process is repeated indefinitely.

In addition to the large expense involved in this useless and endless work there is irrevocable loss of precious metal with

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[1] The following table shows the gold coinage executed at the mints of the United States during the fiscal year ended June 30th, 1897:

Denomination.	Number.	Value.
Double Eagles..........	2,990,241	$59,804,820.00
Eagles......................	804,301	8,043,010.00
Half Eagles..............	747,802	3,789,010.00
Quarter Eagles..........	23,946	59,865.00
Total gold..........	4,566,290	$71,646,705.00

each handling, melting, and coining. I believe that all this is unnecessary. It would be perfectly feasible for the nations to agree upon some simpler method of adjusting trade balances at a tithe of this cost; and even if the time shall not yet have come for making such settlements by a sort of international clearing house, a partial solution of the difficulty would be found in the adoption of an international gold coin, or in the more general employment for export of fine gold bars instead of coin, which have been assayed at the mints or United States Assay Offices and officially stamped with their weight and fineness. There is less risk of loss by robbery in transshipment of such bars, and counterfeiting is not likely to prove a dangerous impediment for several reasons, one of which is that such bars do not pass into general circulation.

It is, of course, necessary, before we can hope to interest foreign governments in any improvement in international monetary matters, that we should adopt a reform in our own currency, bringing order out of the present chaotic condition.

In conclusion, I desire to call your particular attention to the valuable collection of early American coins, as well as coins of other nations, deposited in this Museum by Mr. Robert C. H. Brock, of Philadelphia, from which the Director, Mr. Culin, has had the illustrations made. This collection is rich in specimens of all of the issues mentioned, and they are in excellent preservation.

DR. E. B. LANDIS.

Dr. E. B. Landis, a corresponding member of the University Archæological Association and a valued contributor to the Museum, died at Chemulfo, Korea, on the 16th of April last after three weeks' illness. Dr. Landis graduated in Medicine Department of the University of Pennsylvania in the class of 1889, and went to Korea in 1890. He at once undertook to collect archæological specimens for the Museum, and in the following year transmitted a valuable series of objects from graves in Song-Do. Important collections were subsequently made by him, and at the time of his death he was editing a catalogue of his Korean coins which he had presented, for publication in the BULLETIN. Dr. Landis contributed numerous papers to scientific journals on Korean customs. During the war between China and Japan he rendered eminent services to the Chinese sick and wounded, for which he received a decoration from the Chinese government. His early death is a loss not only to his friends, but to the science to which he was devoted.

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